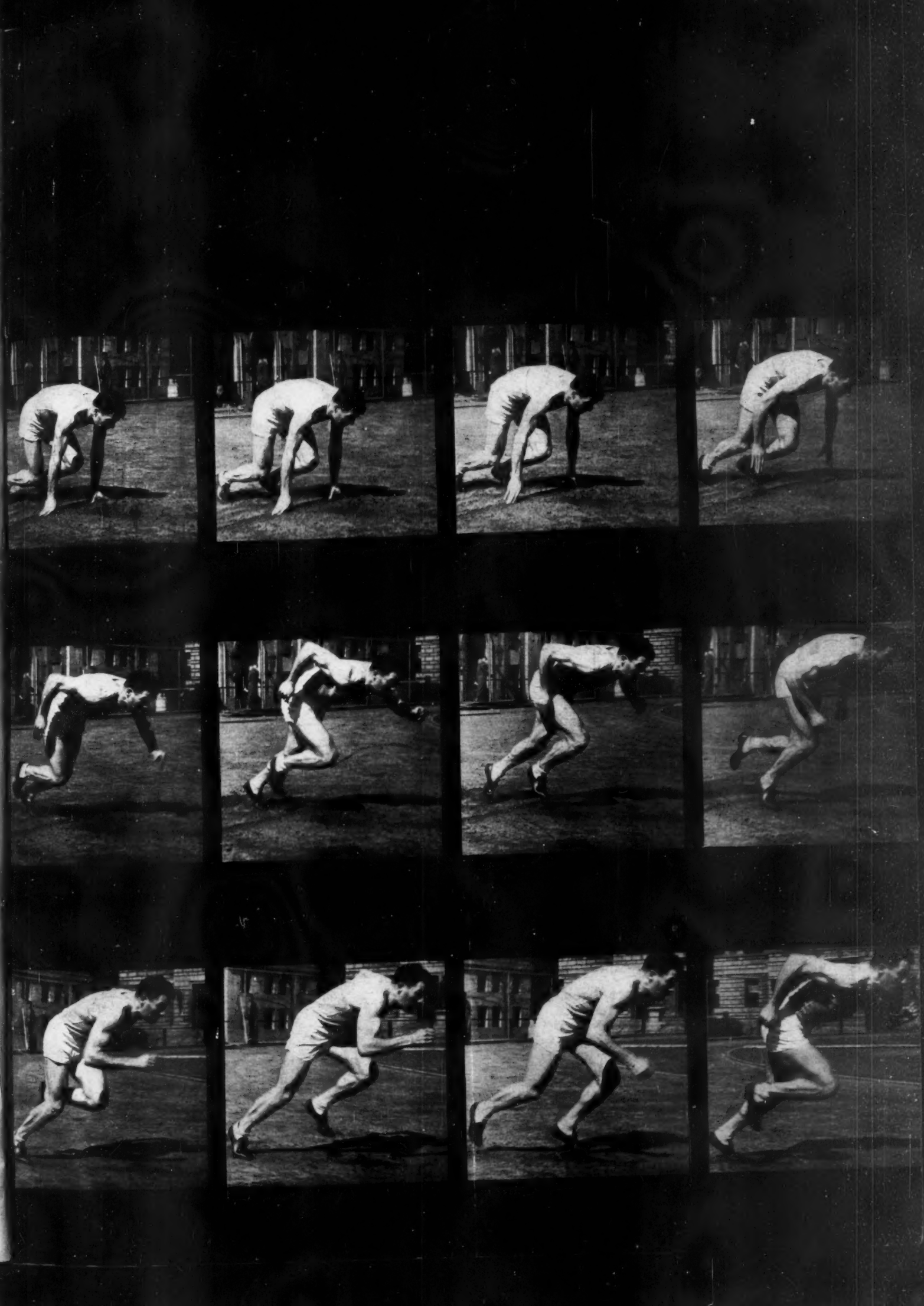
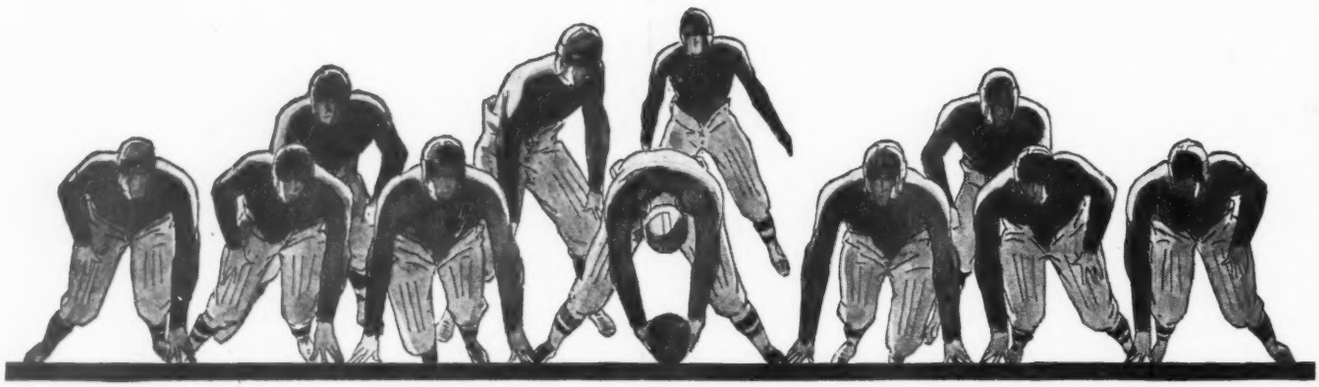


SPRING PRACTICE USHERS IN



SOME NEW IDEAS ON SPEED!

PARE off weight, shear away excess bulk, bolster structural strength—and any engine (even the *human* one!) yields more power and speed. Without sacrifice of safety.

Right now, in time for Spring Practice, Reach, Wright & Ditson offers a complete new line of football equipment. *Everything*—helmets, shoulder guards, football pants—has been made *lighter* for increased speed. And despite its lightness, it's *safe. Made* safe by incorporating all the latest and surest protective devices.

Have your Reach, Wright & Ditson Dealer show you this new line before you outfit your boys for 1935. And see for yourself how *speed* and *safety* have been brought together in this new football garb.

2-Piece Football!

See, also, the *Reach AIR-FLITE Official 2-Piece Ball.* No lumpy seams at ends, so it bounces accurately when it lands on its nose—a decided advantage on drop and place kicks. No underseam—which permits all kicking on a full panel. The lacing is set in the center of a panel—so the *passer* gets a better grip . . . and better control.

If *price* is an important consideration, remember this: There's Reach equipment to match every budget. And dollar for dollar money can buy no finer. A. J. Reach, Wright & Ditson, Tulip and Eyre Streets, Philadelphia, Pa.

A. J. REACH, WRIGHT & DITSON

1935 FOOTBALL EQUIPMENT

The bugler sounds

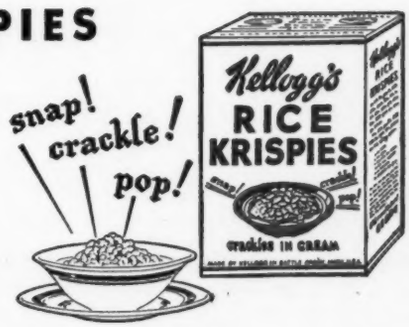
A call to eat

and so do *Kellogg's* RICE KRISPIES

THE sound of Kellogg's Rice Krispies is always inviting. And so is the taste! No other rice cereal is so crisp and crunchy — or has the same delicious flavor.

Rice Krispies are an excellent food for boys and girls in training for athletics. They're not only appetizing but nourishing and easy to digest. Extra good with fruits or honey added. A fine bedtime snack for hungry youngsters because they promote restful sleep.

Grocers everywhere sell Kellogg's Rice Krispies in the red-and-green package, with its inner WAXTITE bag that keeps the cereal oven-fresh. Also available for school lunchrooms in individual packages. Made by Kellogg in Battle Creek. Quality guaranteed.



Listen!— get *hungry*

Outdoor Track and Field Records at a Glance Up to Date

	○ NATIONAL INTERSCHOLASTIC RECORD	● NATIONAL INTERCOLLEGIATE RECORD	■ WORLD'S RECORD
50-YARD DASH	5.4s. Borden, Hyde Park H. S. (Ill.), 1898 Eckersall, Hyde Park H. S. (Ill.), 1903 May, Rochelle, Ill., 1905 Harrison, Crane, Ill., 1906 Southard, Edwardsville, Ill., 1919	NO INTERCOLLEGIATE RECORD	NO WORLD'S RECORD
100-YARD DASH	9.4s. Jesse Owens, East Tech, Cleveland, O., 1933 *(World's record share not applied for)*	9.4s. Simpson, Ohio State, 1929 *(starting blocks)* Meier, Iowa State, 1930 *(starting blocks)* Wykoff, So. California, 1930 Metcalfe, Marquette, 1933	9.4 Frank Wykoff, U.S.A., 1930
220-YARD DASH *(around one turn)*	21.4s. Eugene Goodwillie, Chicago Univ. H. S., 1923	NO INTERCOLLEGIATE RECORD AROUND A TURN	NO WORLD'S RECORD AROUND A TURN
220-YARD DASH *(straightaway)*	20.7s. Jesse Owens, East Tech, Cleveland, O., 1933	20.4s. Ralph Metcalfe, Marquette, 1933 *(World's record not applied for)*	20.6s. Roland Locke, U.S.A., 1926
440-YARD RUN *(one complete lap)*	48.2s. Herbert Moxley, Central H. S. (Columbus, Ohio), 1928	46.8s. Glen Hardin, Louisiana State, 1934	46.4s. Ben Eastman, U.S.A., 1932
440-YARD RUN *(straightaway)*	48.2s. Frank Sloman, Polytechnic H. S. (San Francisco), 1915	47s. (Paced) Maxey Long, Columbia Univ., 1900	NO WORLD'S RECORD ON STRAIGHTAWAY
880-YARD RUN	1m.54.4s. R. L. Bush, Sunset H. S., Dallas, Tex., 1933	1m.49.8s. Ben Eastman, Stanford, 1934	1m.49.8s. Ben Eastman, U.S.A., 1934
ONE-MILE RUN	4m.23.6s. Ed. Shields, Mercersburg Acad. (N. J.), 1916	4m.6.7s. Glenn Cunningham, Kansas June 16, 1934 at Princeton, N. J. *See note below**	4m.6.8s. Glenn Cunningham, U.S.A. June 16, 1934 at Princeton, N. J. *See note below**
TWO-MILE RUN	9m.51.4s. Allen Swede, Mercersburg Acad. (N. J.), 1918	9m.13.6s. H. A. Brocksmith, Indiana, 1932	8m.59.6s. Paavo Nurmi, Finland, 1931
120-YARD HURDLES 3ft.6in. hurdles *See note below†*	14.7s. Philip Cope, Classen H. S., Stillwater, Okla., 1933 *See note below‡*	14.1s. George Saling, Iowa, 1932 *(World's record not applied for)*	14.2s. Percy Beard, U.S.A., 1931
220-YARD HURDLES 2ft.6in. hurdles *(around one turn)*	24.4s. C. Cory, Chicago Univ. H. S., 1913 F. Loomis, Oregon H. S. (M'nn.), 1916 D. Kimball, Deerfield-Shields H. S., 1920	23.8s. C. R. Brookins, Iowa, 1924	NO WORLD'S RECORD AROUND A TURN
220-YARD HURDLES 2ft.6in. hurdles *(straightaway)*	23.5s. A. Oliver, Roosevelt H. S., Dayton, O., 1931	22.7s. Jack Keller, Ohio State, 1932 Glen Hardin, Louisiana State, 1934 *(World's record not applied for)*	23s. C. R. Brookins, U.S.A., 1924 Norman Paul, U.S.A., 1933
RUNNING HIGH JUMP	6ft.6in. †Willis Ward, Northwestern H. S. (Detroit), 1931	6ft.9 1/16in. Walter Marty, Fresno State, 1934	6ft.9⅛in. Walter Marty, U.S.A., 1934
RUNNING BROAD JUMP	24ft.11¼in. Jesse Owens, East Tech, Cleveland, O., 1933	25ft.10⅞in. De Hart Hubbard, Michigan, 1925	26ft.2⅛in. Chuhei Nambu, Japan, 1931
POLE VAULT	13ft.6½in. Wm. Sefton, Polytechnic H. S. (Los Angeles), 1932	14ft.½in. Jack Rand, San Diego State, 1934 Wm. Graber, So. Calif., 1931 Keith Brown, Yale, 1933	14ft.4⅜in. Wm. Graber, U.S.A., 1932
12-POUND SHOT PUT	58ft.10in. Elwyn Dees, Lorraine H. S. (Kansas), 1930	NO 12-LB. INTERCOLLEGIATE RECORD (16-lb.—Jack Torrance, La. State 52ft.10in., 1933)	NO 12-LB. WORLD'S RECORD (16-lb.—Jack Torrance, U.S.A., 1934 57ft.1in.)
DISCUS THROW	154ft.6½in. J. C. Petty, Kaufman H. S. (Texas), 1931	167ft.5⅜in. Eric Krenz, Stanford, 1930	171ft.11¾in. Harald Andersson, Sweden, 1934
JAVELIN THROW	205ft.1¼in. J. H. De Mers, Sand Point H. S. (Idaho), 1927	220ft.11⅝in. Bob Parke, Oregon, 1934	249ft.8in. Matti Jarvinen, Finland, 1933
RELAY—440 YARDS	42.4s. Glendale H. S. (Calif.), 1928	41.1s. Univ. of Southern California, 1934 Univ. of Kansas, 1931	40.8s. Univ. Southern California, U.S.A., 1931
RELAY—880 YARDS	1m.28.2s. Polytechnic H. S., Los Angeles, 1931	1m.26.3s. Univ. of Texas, 1934	1m.25.8s. (Univ. Southern California, U.S.A., 1927
RELAY—ONE MILE	3m.21.4s. Hollywood H. S. (Calif.), 1929	3m.14.3s. Stanford, 1931	3m.12.6s. Stanford Univ., U.S.A., 1931
RELAY—TWO MILES	8m.9.3s. Deerfield-Shields H. S. Highland Park, Ill., 1931	7m.42s. Georgetown, 1925	7m.41.4s. Boston A. A., U.S.A., 1928

○ Approved by National Federation of State High School Athletic Associations.
● Approved by National Collegiate Athletic Association.
■ Approved by International Amateur Athletic Federation.

†Hurdles 3 feet 3 inches in height for the 120-yards event are recommended this year for the first time by the National Track and Field Rules Committee. (Rule 29, 1935 Official Handbook, 112R Spalding's Athletic Library.) Next year it is probable that the Rules Committee will make the 3 ft. 3 in. high hurdle the only official height for the 120-yd. event, and entertain for the 120-yds. national interscholastic record only those performances which were made over the 3 ft. 3 in. height. In Wisconsin the official height of the hurdles in the 120-yd. event is 3 ft. The Wisconsin record over this hurdle is 14.8.

‡Leroy Kirkpatrick, Montezuma Boys School, Los Gates, Calif., ran the 120-yd. 3 ft. 6 in. hurdles in 14.7 at the Long Beach Relays, March 16, 1935.

**The discrepancy of one-eighth of a second between Glenn Cunningham's world's record for the mile and his intercollegiate record for the mile (both of which are derived from the same race, June 16, 1934, at Princeton, N. J.) is ascribable to the International A.A. Federation's refusal to recognize records in tenths of seconds for events longer than 1,000 yards. Hence, Cunningham's 4m. 6.7s on the stop-watches becomes 4m. 6 4-5ths when read at the fifth-second; and 6 4-5ths transposed into tenths becomes 6.8.*

In accepting the above national interscholastic records the question of the age of the record-breaker was not considered by the National Federation of State High School Athletic Associations. At the recent annual meeting of the National Federation a commitee was appointed to investigate the matter of making up a set of records which would take age into consideration. One of the recommended minimum eligibility requirements of the National Federation is: "A pupil shall not have reached his twentieth birthday."

Notable high school indoor performances, 1935—¶ Robert Packard, Rockford, Ill., H. S., ran the 60-yd. dash in 6.2 in a high school meet at Madison, Wisc., March 2. Equals unofficial world's indoor record. Indoor records are not recognized by the International Amateur Athletic Federation. ¶ Ted Ellison, DeWitt Clinton H. S., New York City, ran the 220-yd. dash in 22.2, in a high school meet in New York, March 1, cracking the unofficial world's record by .2 second.

SCHOLASTIC COACH

Reg. U.S. Pat. Off.

IN THIS ISSUE VOL. 4, NO. 8

JACK LIPPERT, Editor OWEN REED, Associate Editor

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ARCH-KEDS—ALL-PURPOSE
Built on a special orthopedic last with a slim foot-conforming shank, this shoe is built for the foot requiring additional support. Combination built-in arch and heel cushion.

OUTDOOR BAL—SOFT BALL
Specially designed for soft ball or kitten ball. Heavy one-piece cleated sole. Shock-Proof insole. Low price.

BIKE-KEDS (bal or oxford)
ALL-PURPOSE
Welt-type outsole with extension edge. Sturdy enough for roller skating, dressy enough for classroom or general sports wear. Combination built-in arch and heel cushion.

SPRING-STEP and CAGER
BASKETBALL
Well-balanced basketball shoes approved by leading players. Spring-step has buffed crepe outsole; the Cager a non-marking black molded sole. Combination built-in arch and heel cushion. Duck insole minimizes friction.

SHORTSTOP DE LUXE
ALL-PURPOSE
One of the lowest priced Keds for all around use. Arch supporting stays, toe cap, and eyelet stays have crushed leather finish. Shock-Proof insole.

Shortstop De Luxe Oxford
ALL-PURPOSE
This lace-to-toe oxford provides a maximum of comfort for sports wear and general use. It is a practical shoe of low price. Shock-Proof insole.

TRIUMPH—TENNIS
This light-weight oxford was designed with approval of one of the greatest tennis champions. Combination built-in arch and heel cushion with duck insole and loose lining.

RAMPART—TENNIS
Moderate price tennis oxford, lace-to-toe. Arch and heel cushion with Shock-Proof insole.

METEOR—BASKETBALL
Low-priced, buffed crepe sole basketball shoe for men and women. A good gymnasium shoe with arch and heel cushion. Shock-Proof insole.

Bring Better Feet *up to the Varsity Squad*

SCIENTIFIC LAST
Keds

● It is easier to encourage the growing of good feet than it is to correct trouble already established. How many times have you found boys who were held back by foot failure who otherwise might have developed into champions? The first requirement of any shoe is that it fit the foot. Freedom of foot action is otherwise impossible. The spring of the foot with the application of power should be helped, not hampered, or good form is impossible. You can do much for your varsity squads by advising the younger boys. Compare the shape of all Keds soles with that of any ordinary canvas shoes and note the difference. Note the shape of the Keds back seam. This is built to fit the Achilles tendon and not bind it. Years of research and experience were required to perfect this scientific last. Keds fit normal healthy feet from sole to upper and make possible a greater foot comfort and support than ever before attained.

Keds

the shoe of Champions

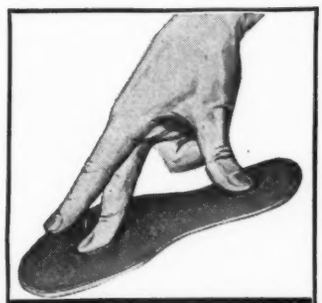
United States Rubber Company

THE ROVER (bal or oxford)
TENNIS OR GYM
Extremely low priced, with corrugated soles and Shock-Proof insoles. Men's bals made with eyelets and lacing hooks. Women's and girls' sizes with eyelets only.

RIGHT WING OXFORD
FIELD HOCKEY
Specially designed for field hockey. High cleats attached to the smooth sole in scientific alignment. Shock-Proof insole.

COMET—BASKETBALL
A popular basketball shoe with combination built-in arch and heel cushion. Duck insole. Molded crepe outsole gives remarkable traction.

SURESHOT—BASKETBALL
A low-priced, light-weight basketball shoe. Loose lined. Shock-Proof insole.



Canvas Shoes *can fit and protect growing feet*

● The second requirement of any athletic shoe is efficient cushioning against shock. The Shock-Proof insole construction, or the built-in arch and heel cushion in Keds, protects against floor shock and lessens fatigue. The canvas top, rubber-soled shoe which every youngster turns to instinctively because "it feels right" will "feel right" for the older boy when it is a Keds, properly fitted. The pounding of a gymnasium floor is tough on feet. Indoors and outdoors canvas shoes should fit—should give proper shock-proof protection. Keds give both.

They Are Not Keds Unless the Name Keds Appears on the Shoes

Keds

the shoe of Champions

United States Rubber Company

BASELINE—HANDBALL
Special handball shoe for concrete court. Buffed crepe outsole, extra thick. Special bumper toe strip, unusually rugged. Shock-Proof insole.

MAGIC-TREAD—BASKETBALL
A low-priced basketball and general outdoor shoe. Arch and heel cushion. Shock-Proof insole.

STRIDE—ALL-PURPOSE
One of the most popular serviceable shoes at a moderate price for knockabout use. Arch supporting stays and Shock-Proof insole.

RADCLIFFE—GIRLS GYM
Low-priced gymnasium shoe for women and girls. Shock-Proof insole. Crepe knurled outsole.

CONQUEST—ALL-PURPOSE
High-grade, sturdy, lace-to-toe style with vulcanized crepe sole. Practical for general use. Also made in white for girls.

Watch this team... lick ATHLETE'S FOOT

"SOAK the feet for ten minutes in a solution consisting of 1 part Zonite in 20 parts of water... Dry the feet and rub thoroughly, after which apply *Zonite Ointment* liberally to the affected areas, allowing it to dry."

The foregoing is taken from the Zonite Athlete's Foot folder. This is the treatment recommended for established cases of Athlete's Foot. The folder also gives a special recommendation for precautionary measures. Every boy should have a copy for his own use.

Free Package of Either Product; also Direction Folders for Boys' Use. Fill Out Coupon—and Mail.

ZONITE PRODUCTS CORPORATION, Chrysler Building, New York, N. Y.
Send me.....copies of the Athlete's Foot folder; also the Zonite product checked below.
( ) Bottle of Zonite ( ) Tube of Zonite Ointment SC-54

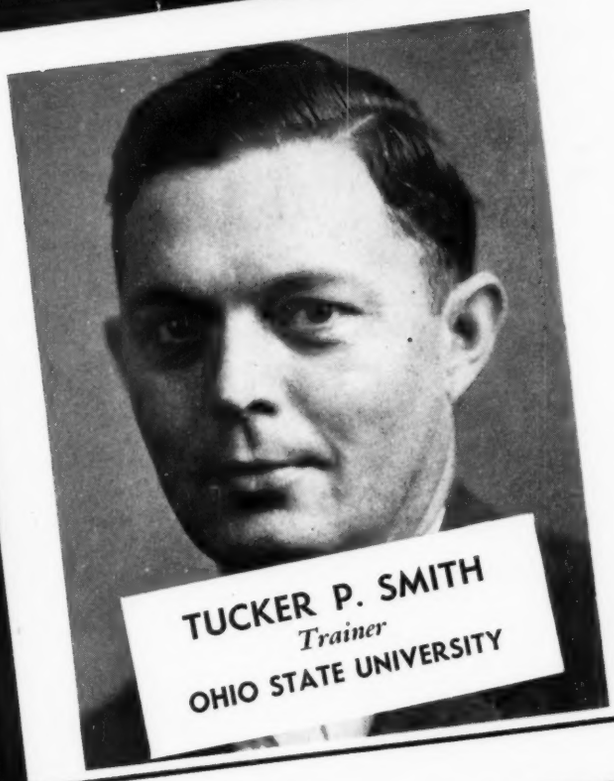
Name.....

Position.....School.....
(Principal, coach, athletic director, physical director)

School address.....

City.....State.....

BULLETIN



TUCKER P. SMITH
Trainer
OHIO STATE UNIVERSITY

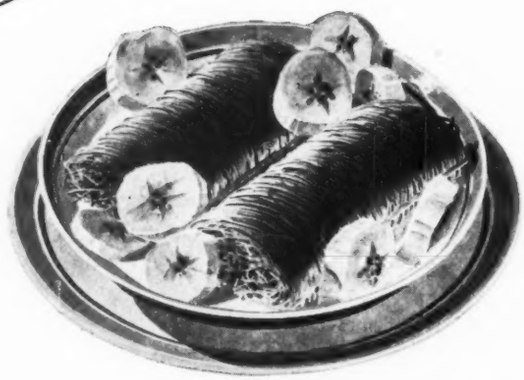
TRAINER SMITH'S RULES FOR YOUR TRAINING TABLE

1. Select foods that build or repair tissues, supply energy, generate heat and provide vital substances which are indispensable in the preservation of good health.
2. Tissue builders are meats, eggs, fish. Energy producing foods include sugar, whole grain cereals, starches. Heat producing foods are butter, oils and meat fats. Essential constituents of the body cells are fruits, vegetables, meat and milk.
3. Regulate your heat producing foods by the climate you are in—less in warm climates and more in cold.
4. Do not over-eat; let your weight and size determine the amount of food you eat.
5. Eat your meals at regular hours, and relax after eating.
6. Drink plenty of water, but use it sparingly during exercise periods. Fruit juices help to relieve that "thirsty" feeling.
7. Milk is a nourishing and easily digested beverage.
8. Vary your diet; this helps you to obtain important minerals and vitamins.
9. If you lack appetite, watch out for staleness. Missing a meal occasionally may do you more good than harm.
10. Your training table is at home, where well-cooked food, attractively presented is available with congenial company. Ask your mother for the foods your coach suggests.

EAT SHREDDED WHEAT FOR HEALTH AND ENERGY

One of a series of posters issued in the interest of good health by **SHREDDED WHEAT**

Coach—PUT YOUR HAND IN EVERY SPRINT WITH THIS EXTRA-ENERGY FOOD



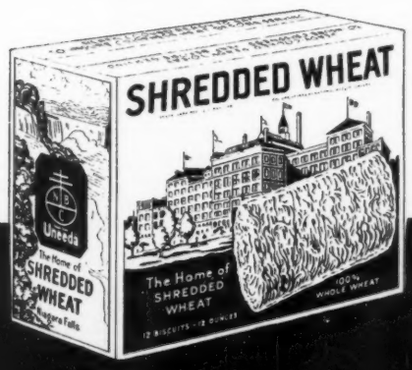
When they're flashing close to the tape, putting an extra strain on every muscle for the final burst of speed—that's when condition counts.

Hundreds of college and high school coaches recommend a daily breakfast of crisp Shredded Wheat because it plays an important part in proper conditioning. It helps supply the vital health elements that tone the body and help build stamina and energy. For Shredded Wheat is whole wheat — nothing added, nothing taken away. It's steam cooked, formed into slender strands, then baked into delicious, golden-brown biscuits.

Put your hand in every competition with this quick-energy food. Help put every man out in front by putting Shredded Wheat on your daily diet recommendations.

SHREDDED WHEAT

NATIONAL BISCUIT COMPANY
"Uneeda Bakers"



ON THE OTHER SIDE OF THIS PAGE IS A POSTER FOR YOUR BULLETIN BOARD. IF YOU'D LIKE EXTRA COPIES FREE FOR GYM AND ASSEMBLY HALL BULLETIN BOARDS, SEND A POSTCARD TO NATIONAL BISCUIT COMPANY, EDUCATIONAL DEPT., 449 W. 14th ST., NEW YORK CITY.

HERE BELOW

Turnstile Amateurism, a new name for sport that is neither amateur nor professional. Hearst would stifle truth in our schools.

THE effort to separate the amateurs from the professionals goes on and on, and it is now at the point where the effort itself can be classified into one of two kinds: it is either (1) uncompromising and ideal; or (2) expedient and practical. The latter is leading by many clicks of the turnstile in this day of public, paying interest in sport.

The effort that comes under the first classification is bent on keeping amateur sport completely free of commercialism. It is a losing cause, but none the less a worthy one. The ideal of amateur sport cannot be reached, or even approximated, where admission is charged for the privilege of watching the sport.

The economy of the country and its institutions being what it is, we must have the gate receipts in order to continue having amateur sport on the scale we are accustomed to. But is it necessary to have the attendant hypocrisy and sham with which we befog the question of amateurism? We think not. It is our guess that *turnstile amateur* sport would be none the worse, either in the pocketbook or in the spirit, if the institutions promoting it would frankly and publicly state what they have to offer athletes.

As you see, we are coining a phrase to designate a class of sport which is neither amateur in the pure sense, nor professional in the career sense. *Turnstile amateur* is our spade-calling name for sport at which admission is charged and for which the athletes get their traveling expenses and whatever else the "law of turnstile amateurism" allows. Turnstile amateurs include the Olympic athletes, Davis Cup tennis players and all tennis and golf players and swimmers who dash about the country at the invitation of swanky clubs, real estate enterprises, and chambers of commerce; players in interscholastic and intercollegiate contests for which admission is charged or for which the athletes get something besides those physical and mental satisfactions which derive only from the game itself.

If these are turnstile amateurs, are there any real amateurs? Indeed yes, millions of them. The majority of students in any high school and college are real amateur athletes. America is alive with sandlotters, swimmers, tennis and golf players, who are real amateurs. No one pays to see them play; they are not on exhibition.

Our hat is off in admiration

We have always shared the view that if a college pays the way of its athletes it ought to come out and say so. We hasten to add that to pay athletes is not our conception of what college and school sport should be. But, facing reality, we see that another kind of sport is with us, and as it seems to be here to stay for a while, we want to give it a name; hence turnstile amateurism. No offense is meant; no odium should be attached to the turnstile amateurs; in fact, we are inclined to admire them. They are quite generally admired; they've got something which the public is willing to pay to see. Our hat is off to them, and our magazine is, in a large way, dedicated to them.

So, when Cornell University came out and declared in favor of athletic scholarships just recently, and Jock Sutherland, University of Pittsburgh coach, told a group of high school athletes that "there isn't anything wrong in aiding the boys who play football," we were inclined to shout "bravo" and feel glad that some of the subterfuge and hypocrisy that befog so-called amateur college sport, was clearing away.

As, or if, the fog continues to lift, there will be other obstacles to make the going difficult. Can the colleges agree on an "aid" or "wage" scale, and if they do can they trust one another to abide by it? That would remain to be seen. We think it would be worth a trial. In the meantime let's not go on fooling ourselves about amateur sport. There is amateur sport and there is turnstile amateur sport.

Educational note

EVERY person in American education should be alive to the campaign being conducted by the Hearst newspapers against academic freedom. What is education if it is not the right of free inquiry into all matters, whether they be animal, vegetable, mineral or political? Truth-seeking is reduced to a farce, as it is in Germany at present, when teachers become the frightened subjects of an insidious censorship such as William Randolph Hearst is attempting to set up in our schools. Hear what Professor Charles A. Beard, eminent American historian, said, speaking last month before an audience of educators at Atlantic City in a preliminary session to the National Education Association Department of Superintendence convention:

> "In the course of the past fifty years I have talked with Presidents of the United States, Senators, justices of the Supreme Court, members of the House of Representatives, Governors, Mayors, bankers, editors, college presidents (including that great scholar and thinker, Charles W. Eliot), leading men of science, Nobel Prize winners in science and letters, and I have never found one single person who for talents and character commands the respect of the American people, who has not agreed with me that William Randolph Hearst has pandered to depraved tastes and has been an enemy of everything that is noblest and best in our American tradition.
>
> "There is not a cesspool of vice and crime which Hearst has not raked and

[Concluded on page 34]

MECHANICS OF THE HIGH JUMP

By Thomas Kirk Cureton

A physicist analyzes the high jump and gives conclusions which materially aid coaching it.

This is the fourth of Prof. Cureton's series of five articles on the laws of physics and body mechanics as applied to performance in track and field events. The final article next month will deal with the broad jump.

HIGH jumping efficiency is governed by the laws of mechanics which apply to both the internal workings of the body and to the body as a whole being projected in its parabolic course of flight through the air. *The projection of any object upward from the ground is fundamentally a problem of mechanics.*

Internally the problem involves consideration of the production of the muscular force and the transmission of this force to the ground through the bony system of levers. The muscles contract, and extend (straighten) the joints. This permits force to be exerted on the ground through the foot, the opposite reaction[1] of which forces the body upward from the ground. In mechanics, the body as a whole can be treated by dealing with the theoretical composite center of the mass. This point is called the center of gravity. It is located at 57/100th of the height from the ground (about the level of the umbilicus), when the body is standing normally with the hands at the sides. It moves upward when the arms or legs are raised. From front to back it is located near the center of the thickness of the body.

The study of these internal forces, the speed and direction of their action, and their effect upon the position of the limbs and the body as a whole is the field of internal body mechanics.

Unquestionably the *power* (force × speed of contraction) of the whole muscle action and the *duration* of its action against the ground (determined by the range of muscle shortening and foot leverage) explain the "natural" spring which all great jumpers have. The power is partly related to the number, length and quality of the muscle fibers and partly to the strength of enervation being received from the nervous system. *It is certain that great acts of physical performance are fundamentally possible because of nerve force and control.* Nerves and muscles are complimentary, both transmit their actions through the levers, which if properly timed and moved in good "form" permit successful performance of an act like high jumping.

Externally the jump is governed most of all by the ordinary laws of projection mechanics[2] which state:

(a) That the height of the jump can be expressed by the formula,
$$H = V \sin \theta \, t - 1/2 \, g \, t^2$$
(b) That the horizontal distance of the jump can be expressed by the formula,
$$S = V \cos \theta \, T$$

KEY

H = Height in feet.
V = Velocity of take-off from ground in ft./sec.
θ = Angle of take-off from ground in degrees.
t = 1/2 total time in air from take-off to landing.
g = 32.2 ft./sec.^{2}
S = Horizontal distance of jump.
T = Time of flight.

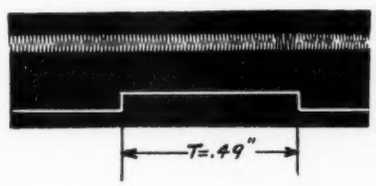


ILLUSTRATION I
TIME OF SARGENT VERTICAL JUMP.

These laws may be applied to the projection of any object from the ground whether it is a cannon ball, a shot, a javelin, a discus or a man's body. They do not explain the inner reasons for the production of muscular force and leverage but the effective power as it carries into the jump is directly reflected in the velocity of the take-off.

From a careful analysis of both the internal and external factors many coaching principles can be derived which are based on mechanical laws. Coaching theory will ultimately have to align with the principles which are based upon these laws.

Proof that high jump is governed by physical laws. The height of the vertical spring made by a jumper can be determined by a stop watch and a simple calculation. This scheme was applied to the high jump several years ago by A. V. Hill,[3] who pointed out that the ordinary laws of mechanics were applicable to high and broad jumping. Physicists have used these same calculations for many years. Two experiments are briefly described which prove the applicability of the laws.

(a) THE SARGENT VERTICAL JUMP[4] is a vertical spring into the air to see how far above standing height a subject can spring. It is the maximum vertical distance a subject can project his weight into the air. A recent project[5] in the physics laboratory at Springfield College has demonstrated that the height of the jump can be determined from the time of the jump from start to finish if the time is accurately recorded. The jumpers stood on a flat platform underneath which was a spring switch which broke contact the instant the jumper left the platform and made contact again as soon as the jumper landed back upon it. The time was recorded by means of a vibrating tuning fork which recorded time in vibrations of 1/100th. sec. A sample of the result is as follows (Illus. I):

$T = .49$ sec. $t = .245$ sec.
$H = 1/2 \, g \, t^2$ (law of falling bodies)
$H = 16.1 \times (.245)^2$
$H = .966$ ft. or 11.59 inches.

Calculated height of jump = 11.59 inches.
Measured height of jump = 11.5 inches.

The above calculation makes use of the well known mechanical principle that a body projected from the ground requires exactly the same amount of time to rise to maximum height as it does to fall from the peak height to

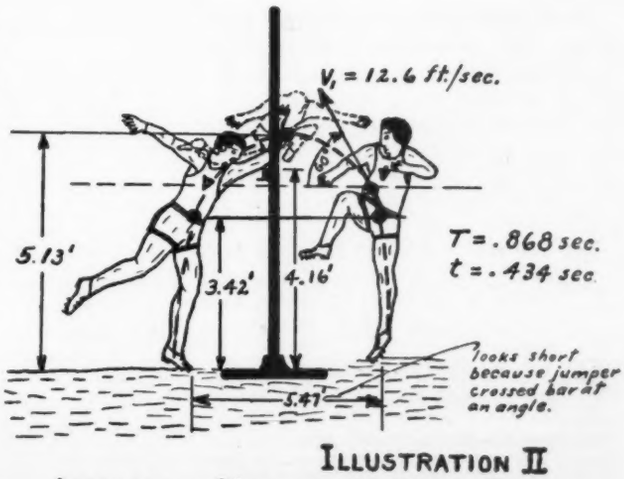


ILLUSTRATION II
ANALYSIS MADE FROM MOVIE FILM.

[1] Newton's law of physics states that for every force there is an equal and opposite reaction.

[2] See Erikson, H. A., *Elements of Mechanics*, McGraw-Hill Book Co., N. Y., or any standard work on mechanics.

[3] Hill, A. V. "The Physiological Basis of Athletic Records, *Scientific Monthly*, vol. XXI, pp. 409-428, Oct., 1925.

[4] This test of springing power was first used by D. A. Sargent (*A. P. E. A. Review*, 26:118, April, 1921). It has been strongly validated as a measure of explosive energy by L. W. Sargent (*A. P. E. A. Review*, 29:47, Feb. 1924), C. H. McCloy (*Research Quarterly*, A. P. E. A., Vol. III, No. 2, May, 1932) and H. L. MacCurdy ("A Test for Measuring the Physical Capacity of Secondary School Boys," doctor's thesis, Teachers College, 1933).

[5] Elder, H. and Holmes, W., "Height in the Sargent Vertical Jump from Time Observations," physics project, 1935, Springfield College.

the ground. Also, that the time to fall is the same whether the object falls vertically or on a curve to the ground.

(b) TEST CASE OF ACTUAL HIGH JUMP—A number of test cases have been made to determine how nearly the height of a regular high jump can be accounted for by the simple laws of projection mechanics. A sample is given as tested by the writer at Springfield College.

A subject (Vizely) was photographed in a high jump (Illus. II). The film was later analyzed in the laboratory.[6] The following observations were made by the measurements taken from the film:

$V_1 = 12.60$ ft./sec. (velocity of body in leaving ground)

$O_1 = 60°$ (angle of take-off measured between a horizontal line through the center of gravity and the tangent to its direction as the body leaves the ground)

$T = .868$ sec. (complete time of flight)

$t = .434$ sec. (time to rise to peak or to fall from peak to ground)

Time Up = 77 shutter clicks × .0039 sec./click = .434 sec.

Time Down = 77 shutter clicks × .0039 sec./click = .434 sec.

Using the height formula,

$H = V_1 \text{ t sin O} - 16.1 \text{ t}^2$

$H = 12.6 \times .434 \times .866 - 16.1 (.434)^2$

$H = 1.71$ ft. (distance c. of g. raised above normal height)

The jumper raised his center of gravity 1.71 feet above the normal height of his center of gravity above the ground (3.42 ft.). This gives a total of 5.13 ft. that his center of gravity was above the ground at the peak of the jump. The actual measured height of the bar was 4.16 ft. This allows a difference of .97 ft. (11.65 inches) for his center of gravity to clear the bar. This is reasonable and scaling the moving picture film of the act shows that it is very close. Thus, the height of *this* jump is shown to depend upon:

(1) The velocity of the spring from the ground.

(2) The angle of take-off.

It is reasonably the same for any jump.

Mechanical Elements of the High Jump. The science of high jumping, therefore, boils down to three major groups of mechanical elements, namely, the take-off velocity, the angle of take-off, and the form in wriggling over the bar.

1. ***The Take-off Velocity,*** which depends upon:

(a) The elastic rebound from the *foot-stamp* and the force of muscular action in extending the ankle, knee and hip joints which immediately follow.

(b) The inertia of the free leg kick and lift of arms acts upward in the direction of flight. This inertia at first strengthens the force of the foot-stamp and then lifts the body in the direction of the movements. This is explained by Newton's laws of motion:

(1) *Every force has an equal and opposite reaction.* The fast upward kick and lift of the arms exert a reaction which travels downward through the body to the pushing foot to increase its force of pressure against the ground, the reaction of which acts on the theoretical center of gravity to cause it to lift from the ground.

(2) *A body started in motion tends to continue in motion.*

Illustration III

(From *High Jump*, American Sports Publishing Co. Dick Landon)

The leg and arm at the end of their upward kick and thrust, respectively, tend to keep going because of inertia and pull the rest of the body after them.

2. ***The Angle of Take-off*** can be regulated by practice. The best high jumpers take-off from a point on the ground two to four feet in front of the vertical plane through the cross-bar. By plotting a simple graph it may be shown that the angle of take-off must vary between 50° and 75°. Theoretically the larger angle would give the greatest height. However, there is greater danger of hitting the bar on the way up or coming down on top of it because of a smaller amount of horizontal distance covered. ***There is a definite relationship between the angle of take-off, the vertical height, the horizontal distance covered and the amount of projection force or take-off velocity.*** The accompanying tables (Illus. IV.), give these relationships as calculated theoretically.

The tables (Illus. IV) show that:

(1) It is economical of energy to take-off as close to the bar as possible.

(2) The time of the body off the ground is governed only by the height of the jump.

(3) The take-off angle varies from 75 to 50 degrees with the larger angle being ideal.

(4) That for a given amount of energy in the spring, the higher jump will be made with the take-off as close to the bar as will permit clearance, closer to 2 feet than to 5 feet and the distance covered horizontally will be nearer 3 than 8 feet.

(5) That the height of the jump depends upon the velocity of take-off and the take-off angle.

(6) That the energy of the jump depends upon the velocity of the take-off (K. E. = $\frac{1}{2}$ Mv^2) for a given weight jumper.

(7) That a new world's record jump of 7 feet will require a take-off velocity of 22 to 25 ft./sec., a take-off angle nearer 78 degrees than less and will cover nearer 3.76 ft. than greater distance.

3. ***The Weave Over the Bar*** is also governed by mechanical principles. The object is to clear the bar with the center of gravity being raised the least possible distance above the bar. It is possible for an object such as a rope to pass over a bar with the c. of g. always below the bar. This requires least energy of all. When a jumper takes a jack-knife position the c. of g. lies outside of the body and with a dive and roll over the bar a jumper may actually pass over the bar while the c. of g. passes below it.

The history of high jumping has seen a gradual approach to this ideal. The old "scissors" style, (Illus. V-A), carries the center of gravity too high and requires too much energy for the height attained. The "Sweeney" style of jump introduced a partial layout permitting clearance with the c. of g. closer to the bar (Illus. V-B). The "Eastern" style with its development of the "cut-off" and "leg-lift," brought a better layout and weave over the bar (Illus. V-C) which permitted the c. of g. to be kept still lower when performed in the ideal manner. The latest development has been the "Western" style or "Roll" which gets the c. of g. the closest possible distance to the bar (Illus. V-D). However, the two latter styles do not seem to differ much on this point when perfectly executed. *All modifications of style after the body is in the air are for the purpose of executing a better layout and weave over the bar,* to keep the c. of g. lower. Certainly perfection of these maneuvers has increased the high jump record a few inches. It should still be emphasized, however, that the take-off velocity and proper angle are major factors which account for more than 90%, approximately, of the height of the jump among better jumpers. It is important to develop "form" because the 10% difference remaining is enough to determine the winner in close competition. A splendid presentation of the various styles will be found in the Spalding book, "The High Jump," edited by R. L. Templeton. A good article ap-

[6]Method described in March, 1935, *Scholastic Coach.* This experiment was reported in a paper to the American Physical Education Assn., national convention, research section, Cleveland, Ohio, April, 1934.

peared in Scholastic Coach[7] which shows the styles clearly. No one style of the better styles which allow the center of gravity to pass close to the bar is responsible for change in the recent records.

The fine neuro-muscular control necessary to execute the sequence of the approach, leg swing, take-off, leg lift, wriggle over the bar and turn for landing is remarkable. Such control requires infinite patience and careful attention to detail.

It should be pointed out that a jumper cannot increase the velocity of flight by flinging the arms or legs upward during flight. It should be remembered that for every action there is an equal and opposite reaction, i. e., for every part of the body jerked upward, there is another part lowered. The body can be rotated or twisted about the c. of g. by these movements but the mass as a whole cannot be raised. The projection energy comes from the ground push and upward inertia of the limbs.

DISCUSSION

The speed and angle of the approach. A run toward the bar which is too fast necessitates great power to suddenly change the direction at the time of take-off from the horizontal to nearly vertical. Few high jumpers have ever been successful with a long and fast approach, although Clinton Larson, champion in 1919, was a notable exception and Leroy Brown also used a fast approach. Horine, Beeson, Osborn and the present wonders, Spitz and Marty as well as the greatest majority of all jumpers use an approach which begins about 24 feet away and lope slowly toward the bar with only the last three or four steps being speeded up. If, however, the speed of these last three or four steps is too slow, some upward inertia of the kicking leg will be lost. A consideration of the comparative world's records for the standing and running broad jumps gives a superiority of more than a foot to the running style. Osborn's standing high jump record is listed at 5 ft. 5¾ in., and Walter Marty's running high jump record is 6 ft. 8⅝ in. The run undoubtedly permits a harder foot-stamp and also a faster swing through of the lead-off leg toward the bar.

The angle of approach is important from the point of view of the length of time that the body is over the bar. The shorter the duration of this time, the slighter is the possibility of dropping on the bar. The time is shorter when the run is made from directly 90° in front, is intermediate at the 45° angle and is still greater from smaller angles. The side approach seems to permit leaving the ground a little closer to the bar. This has been shown in the tables (Illus. IV) to be desirable. Practical observation shows that most jumpers adopt an intermediate 45° approach.

[7]Holmes, David L. "High Jumping — All Styles," *Scholastic Coach*, Vol. 3, No. 8, April, 1934, pp. 7, 8,9, 36.

A. THEORETICAL SPECIFICATIONS OF 5 FT. JUMP

H Height (ft.)	O Angle (degrees)	t (sec.)	S Distance (ft.)	V₀ Velocity (ft./sec.)	K.E. Energy (ft. lbs.)	Relative Energy (%)
5.0	72	.56	3.25	18.8	823	standard
5.0	64	.56	4.85	19.8	913	+10.9%
5.0	57	.56	6.50	21.3	1057	+28.5%
5.0	50	.56	8.39	23.3	1265	+53.7%

B. THEORETICAL SPECIFICATIONS OF 6 FT. JUMP

H Height (ft.)	O Angle (degrees)	t (sec.)	S Distance (ft.)	V₀ Velocity (ft./sec.)	K.E. Energy (ft. lbs.)	Relative Energy (%)
6.0	75	.61	3.22	20.4	969	standard
6.0	68	.61	4.85	21.2	1047	+8.1%
6.0	61	.61	6.66	22.5	1179	+21.7%
6.0	55	.61	8.44	24.1	1352	+39.5%

C. THEORETICAL SPECIFICATIONS OF 7 FT. JUMP

H Height (ft.)	O Angle (degrees)	t (sec)	S Distance	V₀ Velocity (ft./sec.)	K.E. Energy (ft. lbs.)	Relative Energy (%)
7.0	75	.66	3.76	22.0	1128	standard
7.0	70	.66	5.10	22.6	1190	5.5%
7.0	64	.66	6.85	23.7	1307	15.9%
7.0	58	.66	8.78	25.1	1467	30.1%

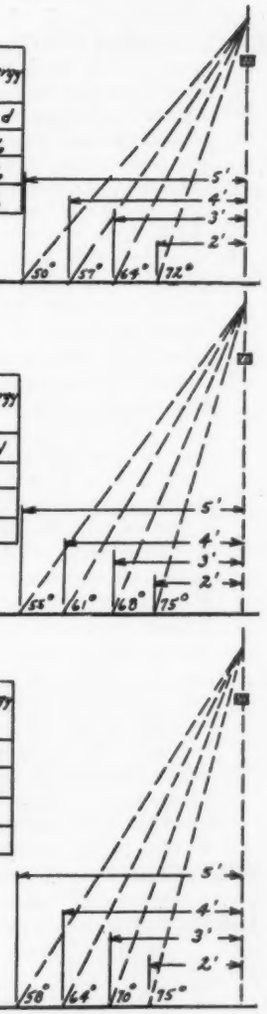


ILLUSTRATION IV. Scale 1 cm. = 1 ft.

Internal power and body build. It has been clearly shown that the most important factor in high jumping efficiency is *internal muscular power* (force × velocity) which permits the joints to be straightened vigorously. A closer analysis of this characteristic takes one into the mysterious depths of internal muscular mechanics. This field is not completely developed but some of the more important principles as related to the high jump are:

1. That a muscle depends upon the quality, length and number of its fibers for contraction force.
2. That the speed of contraction depends upon the strength of innervation and the fluidity of the muscle substance. A tight and viscous muscle contracts more slowly.
3. A muscle will contract faster and with greater force immediately after being stretched. The muscles and ligaments act as springs; when stretched they tend to rebound with elastic force.
4. The longer the range of action in a muscle, the greater is its capacity for power, other factors remaining equal.
5. Muscle force can be transmitted to the ground only through the bones as levers. The efficiency of force transmission depends upon the arrangements of these levers.
6. Energy of muscle contraction depends upon proper conditions of nutrition within the muscle.

Applications to High Jumping

1. The "stamp" of the foot not only increases the force of reaction by the magnitude of the collision between the foot and the ground but the muscles and joint ligaments across the arch of the foot are stretched. The elastic rebound is more forceful in proportion to the force of the "stamp." The foot push should start with the heel all the way down as this permits a longer range of action of the calf muscles and a more forceful push. The muscles are also stretched just before they contract.
2. The knee and hip should be slightly bent in the "crouch" just before the take-off. This permits a more forceful action of the muscles across these joints. Preliminary massage and heat applications or bending and stretching of the ankle, knee and hip joints will loosen up the muscles across these joints thereby diminishing the viscosity and making possible a faster contraction.
3. Experimentation with a mechanical model (Illus. VII, page 34) demonstrated that the strength of the calf

and front thigh muscles was greatly important. The stronger were these muscles (by adding more elastics) the higher the model would spring from the floor. It was also discovered that the model could not jump without the check ligaments in the knee (collateral and popliteal ligaments) and hip (iliofemoral ligament) joints. In the body these ligaments are assisted by muscles, vessels and nerves as elastic structures which check the over-extension of joints.

4. A spring will quickly lose its elasticity (force of rebound) if it is hammered or jarred too much. All good high jumpers report the same story, that they fail to jump their best if they work too much. Almost without exception they state that best results are obtained by jumping only once, twice or three times per week and they all rest two or three days before a meet. This is in accordance with the mechanical principles of elasticity. Muscles, ligaments, tendons and even bones are elastic structures. Their Young's modulus rating can be found in Amar[8]. They lose their elasticity if hammered too much by bounding on hard surfaces.
5. The relatively greater length of the bones has always been obvious among high jumpers. Longer bones require longer muscles. In addition the center of gravity is higher to begin with, which is a fact of great importance in high jumping. Kohlrausch's[9] study on the 1928 Olympic contestants gives the following body measurements for 17 men in the high jump:

Weight....152.0 lbs.—(heavier than all groups of runners)
Height....70.7 inches—(taller than all groups of runners)
Wt./Ht.....2.15—(about the same as runners but much less than weight men, boxers, wrestlers, etc.)
Vital Capacity....4.3 liters.
Leg Length....55.5 cm.

Amar[10] states:

"In jumping, the greater part of the work is done by the muscles of the legs and shoulders * * *. The mass of the body is also an important factor, since the height of the jump must necessarily be inversely proportional to that mass. Also those with long legs can jump higher than those with short ones."

McCloy[11] has statistically demonstrated the importance of arm and shoulder strength in connection with running and jumping.

Krakower[12] studied the relation between physical stature and high jumping in a doctor's thesis at New York University and found that the three skeletal measurements which had the greatest significance in rank—order of their importance are:

(1) length of legs (r = .368 with 177 cases)
(r = .250 with 259 cases)
(2) height (r = .213 with 259 cases)
(r = .200 with 177 cases)
(3) breadth of foot (r = .184 with 125 cases)

His study shows that expert jumpers are above the average in height, length of legs and breadth of foot. The length of their legs is extremely above the expectation for their height and breadth of foot and with a somewhat shorter trunk than would be expected.

In relationship to the above study it it obvious that jumping requires strong feet. As the muscles under the arch of the foot (Quadratus Plantae, Lumbricales and others) and between the metatarsal bones (Interossei) become stronger and larger, the foot becomes broader. Longer legs mean longer muscles of the thigh (Quadriceps) and calf (Surae) which are capable of greater range of action and more work. Height is partly due to longer legs. Cozens[13] demonstrated also that taller and heavier men were better jumpers, using 408 college men for subjects at the University of California (Los Angeles).

Man is relatively inefficient as a jumping animal. Tests of the kangaroos showed that they can jump 39 feet and grasshoppers can jump at least 25 times their standing height. Inspectional examinations of these animals show that the kangaroo has very long hind legs in proportion to body height and tremendously large lower leg and thigh muscles. There is theoretically small foot strength in this animal but tremendously long foot levers which permit a longer application of force to the ground as the body springs. The grasshopper's levers are also very long in proportion to body length. The studies have shown that the better men jumpers are slightly more like kangaroos and grasshoppers in leverage.

Marey[14], in France, was one of the first scientists to investigate jumping. After studying the jumpers in the 1908 Olympics he concluded that the best jumpers do not have massive muscles but typically have long legs in relationship to trunk length. He also stressed the length of the feet. Baxter, the American who won at 1.90 me-

[Concluded, page 35]

Illustration V

(From *High Jump*, American Sports Publishing Co.)

"SCISSORS"

"SWEENEY"

"EASTERN"

[8]Amar, Jules, *The Human Motor*, George Routledge & Sons, Ltd., London, 1920, pp. 94-101.

[9]Kohlrausch, W., *Zusammenhänge von Körperform und Leistung Ergebnisse der anthropometrischen Messungen an den Athleten der Amsterdamer Olympiade*, Berlin, 1929, p. 190.

[10]Amar, Jules, op. cit., p. 371.

[11]McCloy, C. H., "Apparent Importance of Arm Strength" *Research Quarterly*, A. P. E. A., March 1933.

[12]Krakower, H., "Relation of Physical Stature to Ability in the Running High Jump," doctorate, N. Y. Univ., 1934.

[13]Cozens, F. W., "A Study of Stature in Relation to Physical Performance," *Research Quarterly*, American Physical Education Association, Vol. I, March 1930, No. 1, pp. 38-45.

[14]See F. A. Schmidt and W. Kohlrausch, "Physiology of Exercise," F. A. Davis & Co., Phila., 1931, p. 104.

BASEBALL COACHING FROM BIG LEAGUERS

The opportunity baseball affords for choice of action on the part of individual players is perhaps that feature of the game which contributes most to its popularity in the United States. No department of the game offers a greater variety in this line than infield defense. I must confess that it was not until I saw the two American League instruction motion pictures, "Play Ball" and "Batter Up"* did I fully appreciate the extent of the situations in which the difference between the right way and the wrong way of carrying out the play depended on maneuvers that would completely escape the casual spectator or pass him as being relatively unimportant. Yet it was this one time-saving maneuver which meant the difference between the success and failure of the play. Some of these points, borrowed from the films mentioned above, have been incorporated in the following articles, which are based on interviews with American League infielders by Henry P. Edwards of the American League Service Bureau.

WILL HARRIDGE,
President, American League.

FIRST BASE

By Joe Kuhel

Washington

NO first baseman can expect that every throw he receives will be right in the slot. They don't come that way. He must anticipate all sorts of throws, and be especially on the watch for a bad one if the runner is exceptionally fast and the play likely to be close.

A tall, loose-jointed player, quick in his responses, shifty with his feet so that he can adjust his footwork for the wide ones and reach for the high and low ones, is the ideal type for first base.

Position and stance of the first baseman. With no baserunner on first the first baseman should play out from the sack about eighteen to twenty feet toward second, depending on what is known of the batter's hitting proclivities. For left-hand batters who have a tendency to pull the ball, the first baseman should, of course, play closer to the foul line than he would for a player who is known to hit in the other direction as a general thing.

With a runner on first, the first sacker should remain on the bag and move out only when the pitcher has started his delivery. To prevent runners from getting too much of a lead off first, the wide-awake pitcher will make quickthrows to first base. Always turn to the right when tagging the runner. Time is saved by the right turn, for the right side of the first baseman is the side on which the runner is coming in (if the baseman is playing his position properly). Of course, it is altogether out of place to play so that the runner comes in on the left, for this would have the runner, in returning to the base, cross the line of flight of the ball coming from the pitcher.

Cronin going for one

The anticipation of a bunt calls for an understanding with the pitcher as to whether he or the first baseman will field the ball, and who will cover the sack, if the ball is bunted between the pitcher and the first base foul line. I know of nothing that is more exasperating in baseball than to see both the pitcher and first baseman dash for a bunt, while the sack goes unattended.

In trying to grab a wide throw, the first baseman should, if necessary, step off the sack (sometimes he must *leap* off it, as every coach of a high school team is aware) catch the ball if he can, and then jab the cushion with the foot nearest to it.

The best way for a first baseman to find out which is the proper foot to use in contacting the sack under various circumstances is for him to go out on the practice field and experiment for himself. In some of the advice written for first basemen I have read that for a short throw the first baseman should contact the bag with the toe of his left foot. I don't subscribe to this advice. I would say that he should use the foot which feels better with him. Of course, this choice does not apply to throws that come from the second baseman playing deep, or from the catcher. Here there is a clear-cut advantage to be gained by sticking to the left foot.

The first baseman should have a code of signals with the catcher so that he may know when the latter is going to make an effort to nip the runner off first. Incidentally, it will not impair his fielding also to get the sign the catcher gives the pitcher, so that he will know whether the pitcher is going to throw a curve or fast ball, one on the inside or outside. This is, of course, assuming that there is a pitcher on the mound who can put them where he wants them. High schools are not likely to be over-supplied with such assets.

SECOND BASE

By Jimmy Dykes

Chicago White Sox

I WILL call this "What every young second baseman should know," and will give it just as though I were the coach talking to the candidates for the second base position.

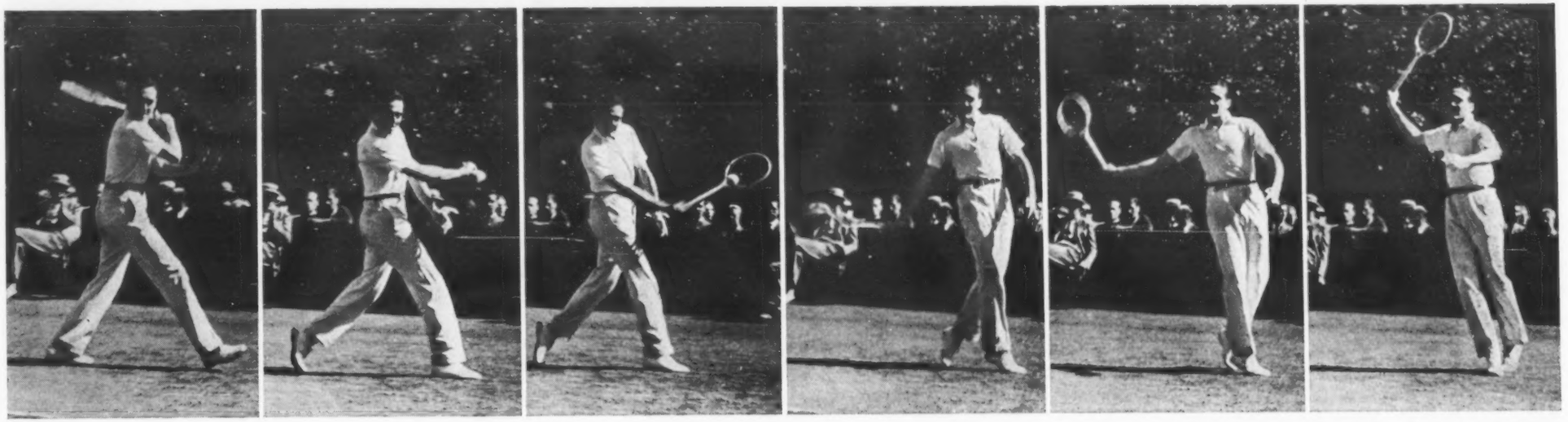
A second baseman, like all the other players around the baselines and in the outfield, is at an advantage over the batter if he knows his batting habits. In a league where each team meets every other team a number of times each season, this knowledge can be picked up. In high school ball it is not so easily acquired. But you should be alert to learn as much of the opponents' playing habits as you can in the limited time at your disposal, and play accordingly. While there may be some excuse [Continued on page 30]

*Both films are available to high schools and other institutions for the asking. However, "Batter Up" is booked through the summer. Rights to "Play Ball" have been turned over to the Fisher Body Division, General Motors Corporation, General Motors Building, Detroit, Mich., and the film will be supplied to high schools on application by the principal or coach. "Play Ball" is a sound film and comes in both 16 mm. and 35 mm. sizes. Schools that do not have sound equipment can arrange with Fisher Body Division to have the film shown by one of their representatives who carries sound equipment with him. "Play Ball" comes in two editions: one is a seven-reel film that is expected to appeal to athletic departments desiring to make a close study of the technical phases of the game; the other is a three-reel picture, which is a condensed version of the longer one and is prepared for general audiences.

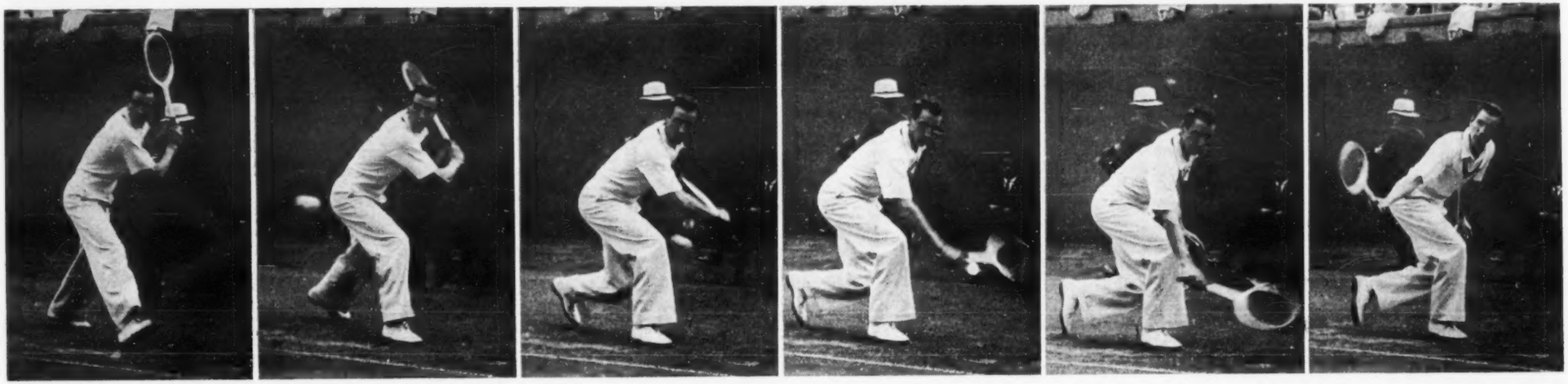
SUTTER ● PERRY

FOUR FAMOUS BACKHANDS

VINES ● WOOD



ABOVE: Clifford Sutter, ranked No. 8 in the U. S. amateur list (No. 3 in 1934) "pulls" a backhand "down the line" (so that the ball returns in a line parallel with the sidelines) by allowing the ball to come well opposite his body before hitting it. Effortless, free and full are words that describe the stroking of this New Orleans youth. In tactics he is a conservative, and he prefers to wage his battle from the baseline. Sutter and Wood make use of the "continental" style of backhand drive, to which the French gave vogue—the wrist dropped below the racquet head at the moment of impact, a feature of the volley.

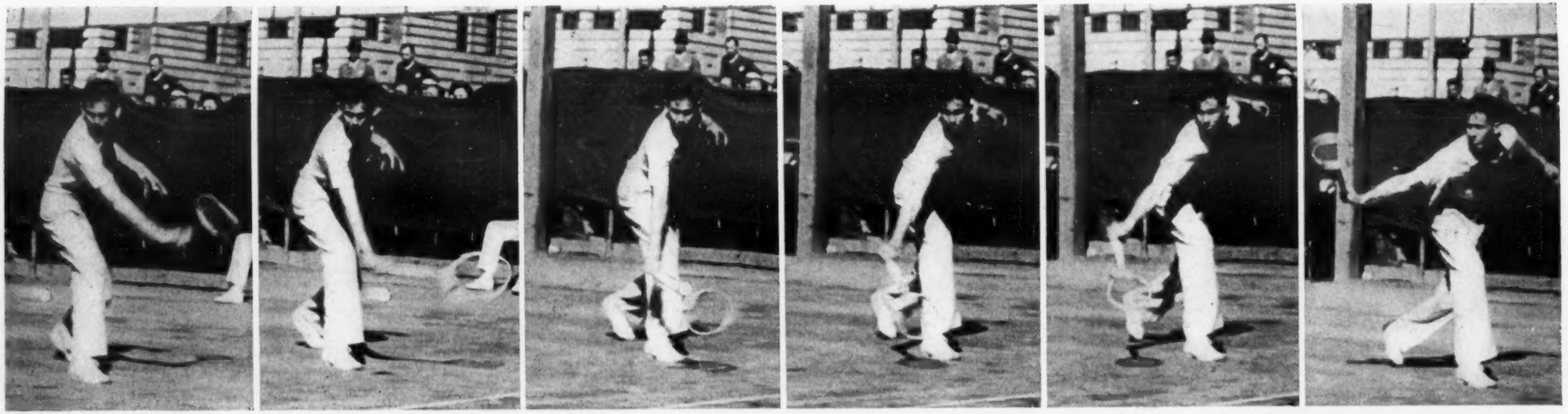


ABOVE: Fred Perry, world's No. 1 amateur (as we go to press), and English Davis Cup ace, playing a low backhand deep in his own court in form which defies censure. To meet the low ball under the most favorable of conditions, he is bending his body and dipping his knees, thus permitting the racquet handle and head to travel on a line more nearly parallel to the ground. His right foot is forward and in advance of his left which permits the transmission of body weight into the stroke, and facilitates the turn of the body and the arm swing which is what the backhand demands in defiance of natural movement.

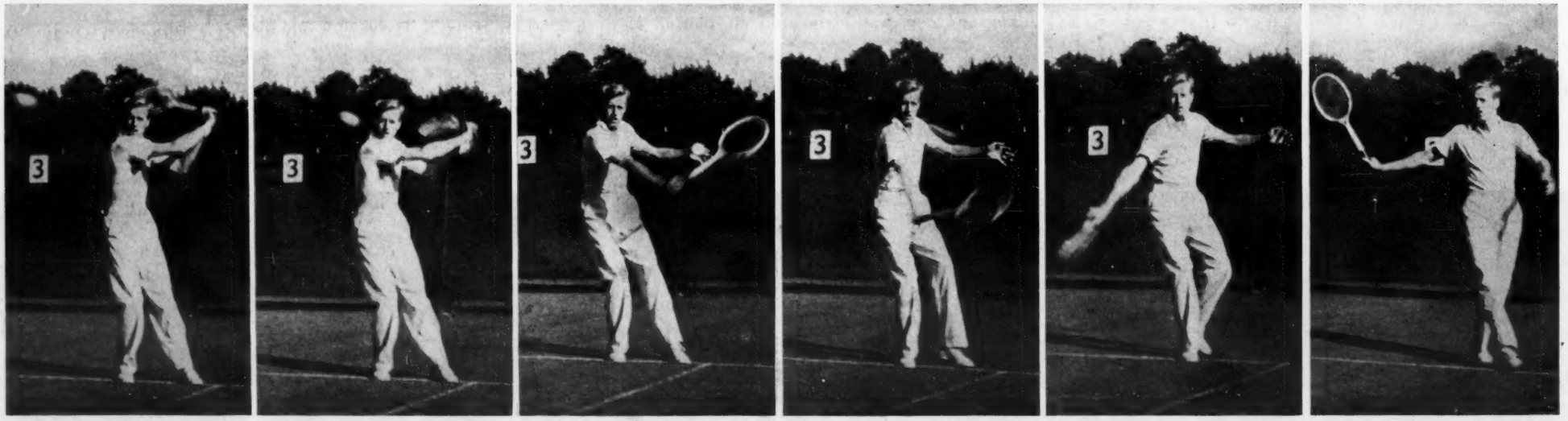
censure. To meet the low ball under the most favorable

right foot is forward and in advance of his left which

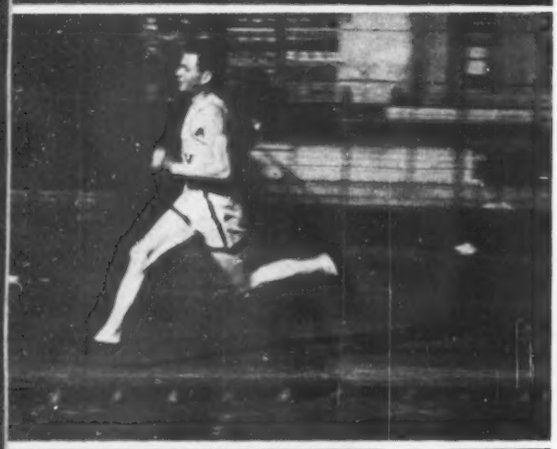
natural movement.

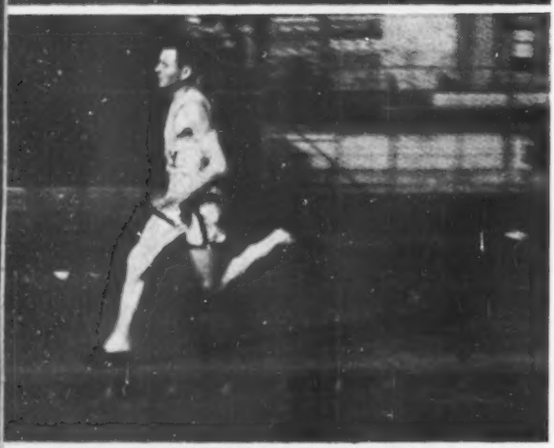


ABOVE: Ellsworth Vines, today's top-ranking player in any class, following some (but not all) of his own advice in stroking a low backhand. In this particular instance he does not dip his left knee as far as Perry does above, but he manages by the great length of his arm and an extreme dip of his right shoulder, to bring his racquet across the ball in good line. Notice the use Vines makes of his left arm and hand to counterbalance the effects of the forward lean, and keep the body well in balance. "Where should I keep my left hand and arm?" Vines is asked by his imaginary pupil in his book "Tennis Simplified for Everybody" (American Sports Publishing Co.). And Vines answers: "That depends on you. Some players extend the arm out as a balance, but I always keep mine pressed against my stomach." Always?



ABOVE: Sidney B. Wood, No. 2 in U. S. national amateur ranking, in a movement epitomizing the silken efficiency which marks his style as one of the most beautiful in the game. Here he is playing a high-bounding ball on its descent, at waistline level, well in advance of his body to make a cross-court angled return. As light-footed as a dancer, this young veteran (he is 24, but he played at Wimbledon at the age of 15) is indulging in a most unprincipled bit of fancy stepping as he tardily brings his right foot forward and across his left, hitting completely off the latter foot and finishing the stroke before the forward foot touches the ground.





Stride

A STUDY of the stride and form of Glen Dawson of Tulsa, Oklahoma, national 1,000-yards champion, from a moving picture taken last month. The form here is not ideal on every point, according to copy-book standards for distances in the neighborhood of the mile. The front knee action is rather high for mile running, and the back leg kicks up perhaps a little too much. This latter fault is more apparent on the kick-up of the left leg than it is on the right, as shown in this particular cycle. This is also true of this runner's action throughout the lap, as the unpublished part of the film shows. The grounding of the forward foot is good — there is a light but steady and firm landing on the heel, which relieves tension on the Achilles tendon, relief which is an invaluable aid to endurance in distance running. This is accompanied by a slight bend at the knee of the forward leg as it comes down. There is no tendency here to over-stride, but the action, at certain stages, seems a trifle labored (as in the third and fourth frames from the top, on the right), while at other stages it reveals the smooth, rolling action of that smoothest runner of them all, Paavo Nurmi. The third frame from the top, at the left, is a case in point. With Dawson it appears that the cycle as the right leg comes forward is his stride's "better half." His arm action on this cycle also appears to be more relaxed. The arms are swinging well free of the side of the body, a characteristic of the stride style with its body "swing" or "roll," which is most apparent in Nurmi and other Finnish distance runners.

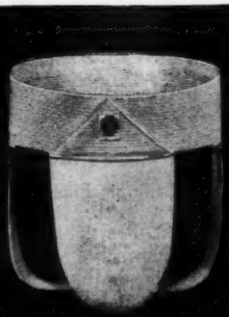
2 out of 3 wear BIKE

● It's true in baseball—as in every other sport. Two boys out of every three participating in high school and collegiate athletics wear Bike supporters. Somebody's guess? No, sir. A national survey recently made by the A. C. Nielsen Company backs up our statement.

● Every inch of Bike webbing is inspected for smoothness and uniformity. No starch or sizing is used. That's why Bike stands up — gives maximum protection — in spite of dozens of trips to the laundry.

● Bike's success dates back almost as far as the game of baseball. For more than 65 years, Bike has been the coaches' favorite athletic supporter. Constant improvements in design and a low price-tag that gets the quick approval of the athletic board have won this outstanding popularity for Bike.

SALES AGENTS: A. S. Callaway, 275 Broadway, New York. Martin & Martin, 5 South Wabash Ave., Chicago. McDonald & Linforth, 420 Market Street, San Francisco. John H. Graham & Co. (Southeastern States), 113 Chambers Street, New York. H. B. Hughes, 839½ North Beckley Avenue, Dallas.



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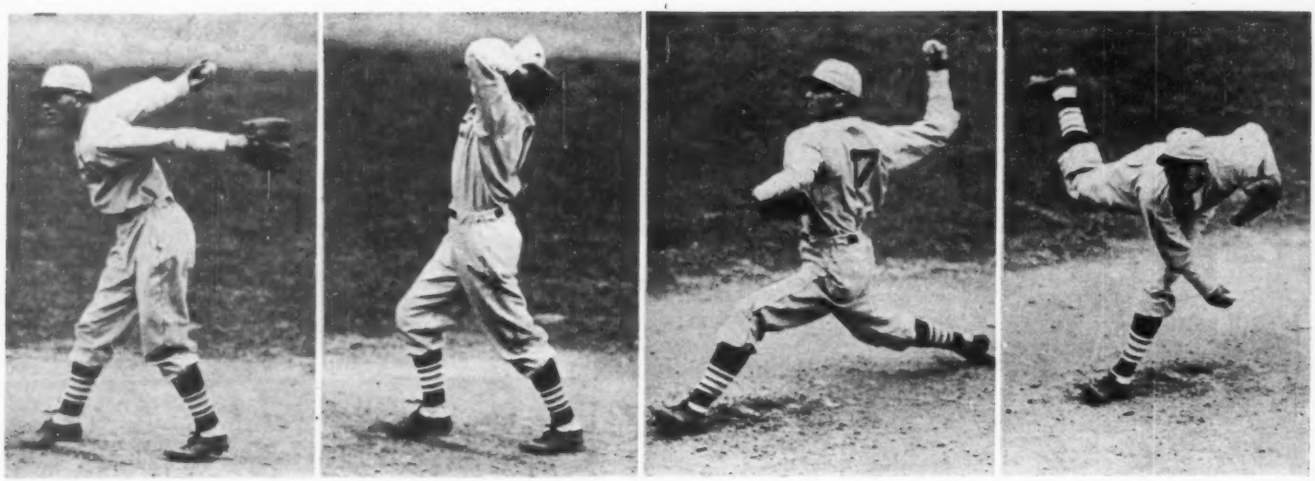


Dizzy's Delivery. From "How to Pitch" by Dizzy Dean (Grape Nuts, Battle Creek, Mich.)

Over the Field

This department is conducted by Hyman Krakower, Ph.D., a member of the staff of the Department of Hygiene, College of the City of New York.

Books on baseball

THE last book written for the high school and college coach on the fundamentals of baseball was published about ten years ago. The explanation of this slump in baseball-book production probably lies in the fact that baseball, unlike our other American games, has changed little during the past decade.

Now, just off the press, comes a series of six baseball booklets written expressly for the coach of baseball by H. S. DeGroat of Springfield College. Each booklet is in the form of the coach's instructions to a particular group of his players: (1) to Batterymen; (2) to First Basemen; (3) to Second Basemen; (4) to Shortstops; (5) to Third Basemen; (6) to Outfielders. The six sell for one dollar. DeGroat has also just issued Baseball Instruction Course Outline, $1. He offers the six sets of coach's instructions and the outline for the combination price of $1.75.

The following is a selected list of books on the technical side of the game:

Berry, Elmer. *Baseball Notes.* New York: A. S. Barnes and Company, 1922. Pp. 86, illustrated—photographs and diagrams. $2.

Text, designed as an aid to young coaches, players, and students of the game, resulting from an accumulation of lectures on baseball theory. The material is contained in outline form, with blank space for notations by the reader. Numerous diagrams illustrate the material presented in the text.

Charnley, Mitchell V. *Secrets of Baseball Told by Big League Players.* New York: D. Appleton and Company, 1927. Pp. 162. $1.50.

This is a compilation of individual chapters contributed by big league players including, Hornsby on "Wait for a Good Ball"; Sisler on "Some Big League Plays"; Luque on "The Work of a Pitcher"; Gehrig on "The Job of Playing First"; Peckinpaugh on "Try to Outguess the Batter"; among others.

Clark, W. J. and Dawson, Frederick J. *Baseball.* New York: Charles Scribner's Sons, 1924. Pp. 205, illustrated—photographs and diagrams. $2.

The authors open the book with an introduction containing a brief description of the evolution of the game. In the body of the text are individual chapters on each of the playing positions in the field, and at bat. After describing "individual" play, team plays are discussed. The book ends with hints to players and spectators.

Claudy, Carl H. *The Battle of Baseball.* New York: The Century Company, 1912. Pp. 377, illustrated—photographs. $1.50.

An attempt to get at the heart of the game and tell it from a boy's standpoint, and to show him how he can become skillful in the game. Baseball is a battle of brains as well as skill, which makes the knowledge of the fundamentals of the game imperative. The author discusses offense and defense, drill, the rules, and umpiring. Christy Mathewson contributed a chapter on "How I Became a Big League Pitcher." An added feature of this book for the youngster is a section on "Simplified Rules."

Cobb, Ty. *Busting 'Em.* New York: Edward J. Clode, 1914. Pp. 282, illustrated—drawings. $1.

In this book are stories of the big leagues. Ty Cobb has listed the high spots of his experiences and connections with the game. He has attempted to give to the reader the inside of life in the big leagues, and baseball as played in fast company.

Dean, Dizzy. *How to Pitch.* Battle Creek, Michigan: Grape Nuts, 1935. Pp. 12. illustrated. Free copy to school coaches.

A booklet for youngsters by the famous St. Louis Cardinals' pitcher, giving advice on pitching skills and tactics. The kind of thing small boys devour.

DeGroat, H. S. *Baseball Coaching Aids.* Coach's Instructions, set of six booklets, $1. *Baseball Instruction Course Outline,* $1. Set, $1.75. H. S. DeGroat, Springfield College, Springfield, Mass. See introduction top of column to the left.

Douglas, Byrd. *The Science of Baseball.* Chicago: Thomas E. Wilson and Company, 1922. Pp. 190, illustrated—photographs and diagrams. $1.

The text contains a detailed description of every phase of baseball for the coach and the player. Margin notations describe the material contained in each paragraph.

Evers, John J. and Fullerton, Hugh S. *Touching Second—The Science of Baseball.* Chicago: The Reilly and Britton Company, 1910. Pp. 308, illustrated—photographs. 60c.

A story of inside play in big league baseball. Famous players are brought into the story as the various elements of the game are described.

Frost, Helen and Wardlaw, Charles D. *Basketball and Indoor Baseball for Women.* New York: Charles Scribner's Sons, 1920. Pp. 154, illustrated—photographs and diagrams. $2.

A small book for the coach and player, the second section of which is devoted to indoor baseball, which deals with the fundamentals of throwing, fielding, batting, base running, and team play. A series of diagrams illustrate various play situations.

Harris, Stanley. *Baseball—How to Play It.* New York: Frederick A. Stokes Company, 1925. Pp. 131. $1.

A man who had managed a big league team to a world's championship has put together a volume of "practical instruction" for each position, together with the strategy and tactics of the game. The qualifications and training for each position are described.

Kellogg's Sports Library. *Baseball.* Battle Creek, Michigan: W. K. Kellogg Company, 1934. Pp. 46, illustrated—diagrams. Free copy to school coaches.

An excellent handbook for boys on the fundamentals of baseball. Many diagrams illustrate clearly the points explained in the text.

Lane, F. C. *Batting.* New York: Baseball Magazine Company, 1925. Pp. 218. $1.

A compilation of one thousand expert opinions on every conceivable angle of batting science, collected over a period of fifteen years from approximately three hundred big league players. Contains hints for batters of all ranks and ages.

Lanigan, Ernest J. *Baseball Cyclopedia.* New York: Baseball Magazine Company, 1922. Pp. 208. $1.25.

Comprises a review of professional baseball, the history of all major league clubs, playing records and unique events, the batting, pitching, and base running champions, world's series statistics, and an alphabetical list of the records of

more than 3500 major league ball players. Supplements are put out each season.

McGraw, John J. *How to Play Baseball.* New York: Harper and Brothers, 1914. Pp. 151, illustrated—photographs. $1.50.

The "Napoleon of Baseball" intended this book to be a manual for boys. The book is written on the premise that many ball players are "made" and not "born." In it are individual detailed chapters on the playing of each position. Three chapters are devoted to pitching, containing a description of the different types of delivery.

Mathewson, Christy. *Pitching in a Pinch.* New York: Grosset and Dunlap, 1923. Pp. 304. 75c.

A book written by a national hero, one who has long been recognized as the greatest pitcher the game has produced. The book has been reprinted eleven times since its first publication date (1912). The text cannot be used for coaching pitchers, but narrates very well conditions that surround a pitcher, by means of stories about the big leagues. Matty describes such things as pitching in a pinch, playing the game from the bench, sign stealing, umpiring, spring training, base runners, etc.

Palmer, Gladys E. *Baseball for Girls.* New York: A. S. Barnes and Company, 1929. Pp. 140, illustrated—photographs and diagrams. $2.

A text giving instruction in indoor and outdoor baseball, with the technic, fundamentals and methods of teaching, and the educational and recreational possibilities of baseball as played by girls and women. The book also covers the team at bat and in the field, as well as the technic of indoor and outdoor baseball, with the rules of the games.

Ruth, George H. *Babe Ruth's Own Book of Baseball.* New York: G. P. Putnam's Sons, 1928. Pp. 299, illustrated—photographs. $2.50 (reprint 75c).

The "Bambino" mixes his story-telling of the big leagues with coaching hints. In describing the offensive and defensive positions, Ruth describes the play of outstanding big leaguers, and what makes them great. The importance of getting the most out of the hitting strength is explained, in making up the batting order.

Ruth, George H. *How to Play Baseball.* New York: Cosmopolitan Book Corporation, 1931. Pp. 127, illustrated—photographs and diagrams. 75c.

A good book, simple and easily understood by the high school boy, written by the one and only "Babe." Short chapters are devoted to every type of playing situation, among which are playing the sun field, covering up the pitch, cutting off the double steal and the pivot on double play.

Spalding's Athletic Library. New York: American Sports Publishing Company.

A valuable series of handbooks that cover the fundamentals, records, and rules of baseball.

79R—How to Pitch. Edited by J. E. Wray, 1934. 25c.

Explanation of the curves and the best use to which they can be put during a ball game. Control is emphasized, and how to keep in condition.

80R—How to Bat. Edited by John B. Foster, 1930. 25c.

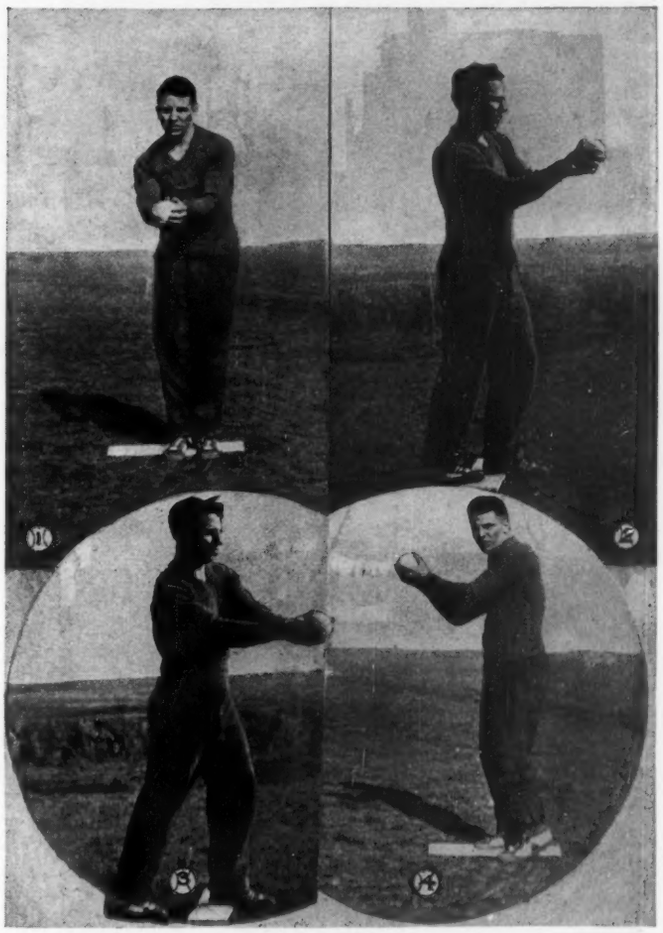
Everything necessary to know about batting, including a chapter on batting for boys, by McGraw.

81R—How to Umpire. Edited by Billy Evans, 1929. 25c.

An explanation of the single and double umpiring systems as well as methods of conducting a ball game.

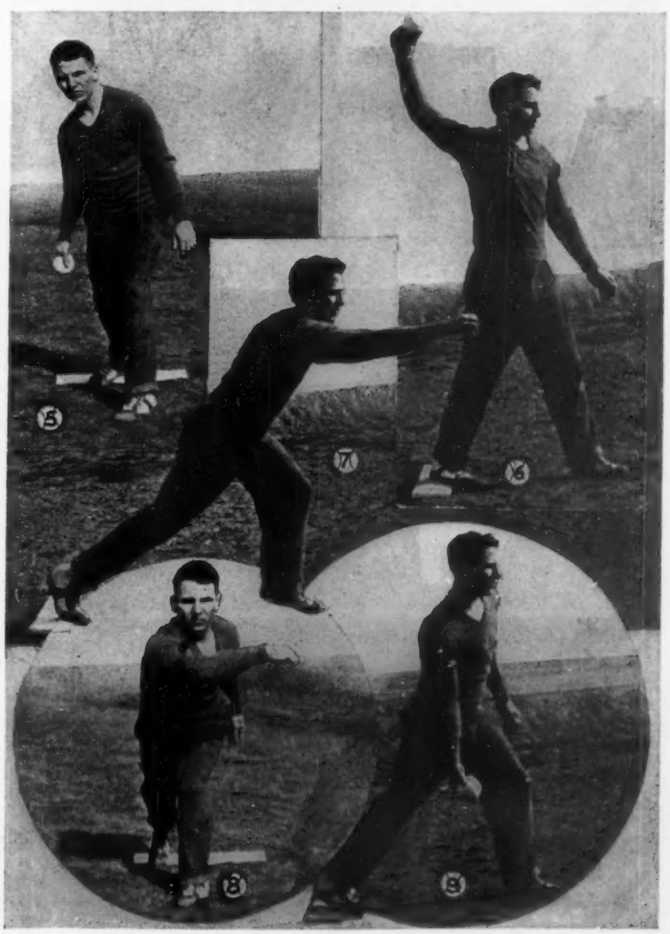
[Concluded on page 37]

How to Pitch and How Not to Pitch, from the 1935 Softball Guide, Spalding's Athletic Library, No. 12R

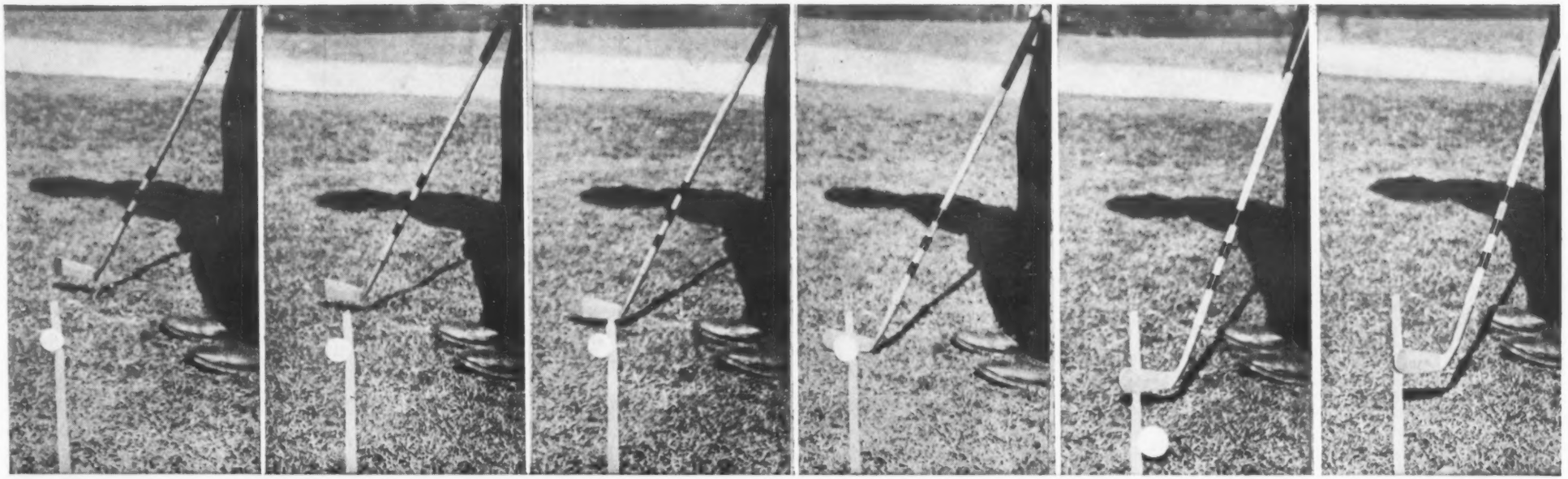


1—Start of Pitch. RIGHT—Facing batsman, both feet on top of plate, ball in both hands in front of body. 2—Start of the Pitch. RIGHT—Facing batsman, ball in both hands, in front of body, heel of one foot and toe of other on top of plate. 3—Start of Pitch. WRONG—One foot back of and not in contact with plate. 4—Start of Pitch. WRONG—Body turned toward baseline, not facing batsman.

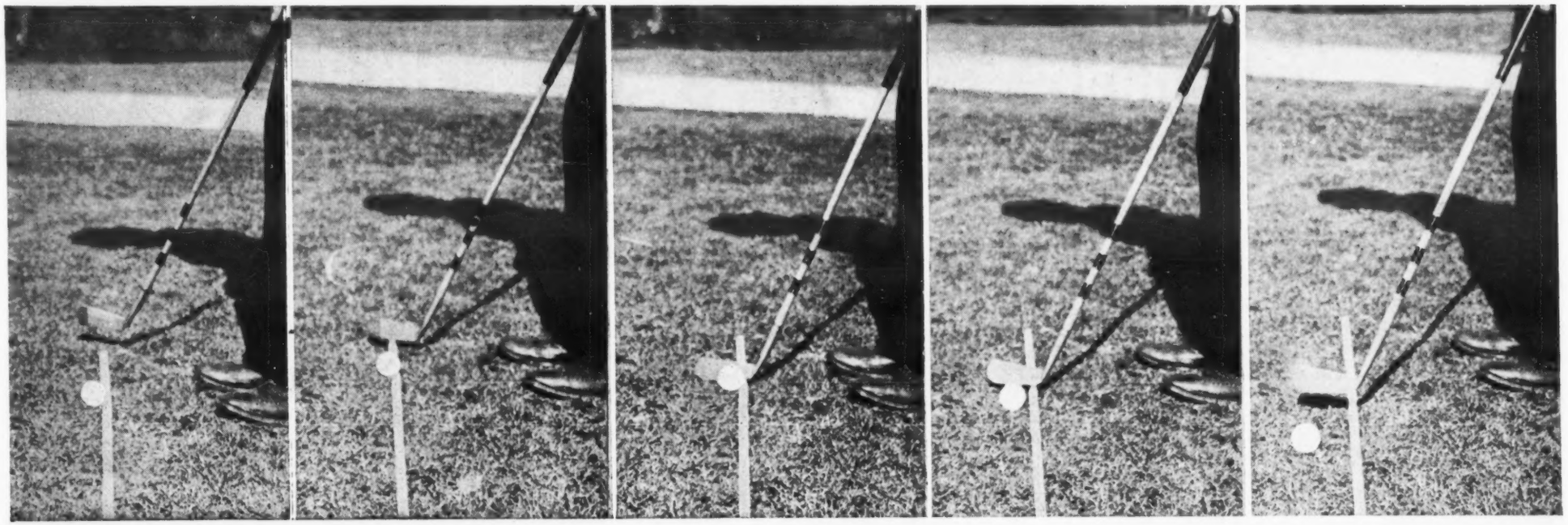
COURTESY, THE AMERICAN SPORTS PUBLISHING CO.



5—The Pitch. RIGHT—Halfway through and the step toward the batsman, arm coming through, with ball close to the leg. 6—The Pitch. RIGHT—The so-called "Windmill" pitch; arm starts upward in front and over in a full-arm swing. 7—The Follow-Through. RIGHT—Arm toward batsman, well past body, foot just leaving plate. 8—The Follow-Through. WRONG—Arm across body. 9—The Pitch. WRONG—Note outward twist of arm and elbow against body; snap or throw from hip without follow-through.

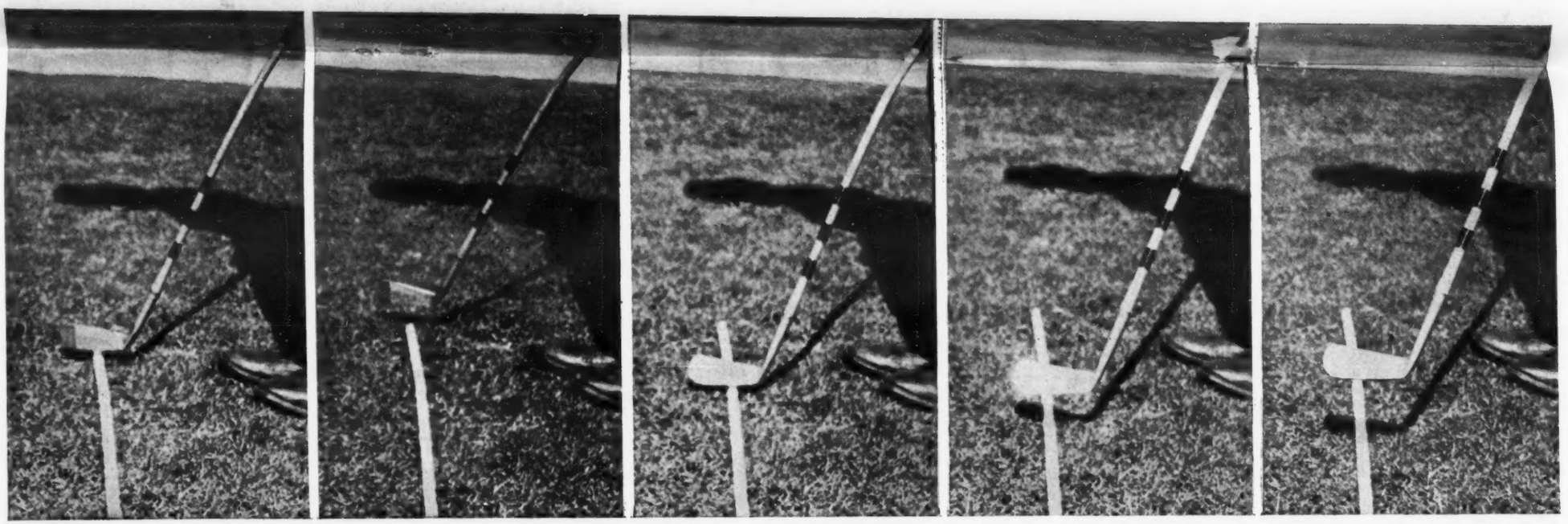


Above: Series A—Putts that Go to the Left



Above: Series B—Putts that Go to the Right

Above: Series B—Putts that Go to the Right



Above: Series C—Putts that Go Straight for the Cup

WHY PUTTS GO WRONG

By Bill Jones

WILLIE PARK was one of the grand old masters of golf, the first of a long line of Parks who have made golfing history the world over. He was the first British champion and at the mention of his name golfers in Scotland still raise their caps in reverence. Years ago, when golf was only a vague rumor in the United States, he made a brief statement that has since become an axiom—"The man who can putt is a match for anyone." That was said in the days of the gutty ball when distance hitting was at a premium. How much more important is putting today when our high-powered ball and efficient implements make almost any green accessible in two strokes.

Today the short game is at a premium and most matches are won or lost on the putting green. Ten, twenty, or thirty yards difference along the fairway means little or nothing. One inch difference on the putting green means victory—or defeat.

A straight putt cannot fail to drop in the hole, provided of course that the ball is stroked with sufficient force. How are straight putts made? Before answering that one, let me warn you that many golf instructors insist that putting cannot be taught—a pupil is either a good putter or a poor one. In one sense that is true, as putting is in a large measure a matter of judgment of distance and direction, the control of nerves, relaxation and confidence. In teaching golf you of course cannot be expected to delve deeply enough into psychology to teach your pupils all of that. You will necessarily confine yourself largely to teaching the mechanics of putting, but I think that a paragraph on the intangible will not be amiss.

Your pupils can acquire judgment of distance and direction through constant practice, even though their senses in this respect are not keen enough to do this naturally. You can, however, drill into their consciousness the vital importance of keeping their wrists free from tension, as relaxed as possible without becoming flabby. Lack of confidence is the mother of tension, but do not fail to point out the difference between confidence and carelessness. Over-confidence causes missed putts through inattention; lack of confidence breeds tension, and likewise missed putts. Between the two lies a very narrow path along which walk those who are called "natural born putters." Let us hope that among your pupils are some of these.

How straight putts are born.

The strip of moving pictures (Series C on page 21) shows how to make a putt that can't help but go straight. The ball in this series has been omitted purposely, so that there will be nothing to distract the eye from the all-important path of the clubhead. The first picture shows the club head at rest exactly at right angles to a line drawn directly to the hole. In the four succeeding pictures the putter is shown at the end of the back swing, just at contact, immediately after contact and finally at the finish of the stroke. Notice how the putter has always travelled straight along the path to the hole and always at right angles to it. This is the one secret of good putting and no one has ever putted consistently well who did not observe it.

Have your pupils practice this swing until it becomes automatic, without a ball until it has been mastered. They will find that it is not so easy as it looks. If a white line such as the one pictured is inconvenient, use a crack in the floor or the edge of a rug. A ball will distract their attention from the primary purpose of this exercise, that of swinging the club in a straight line. You cannot fail to produce good putters if you insist on perfection in this matter.

[Concluded on page 27]

TOBACCO SMOKING AND ALCOHOL DRINKING

By Peter V. Karpovich, M. D.

The "lifting" power of a cigarette is greatly exaggerated. Alcohol as fuel and aid to courage

RECENT experiments conducted by Haggard and Greenberg on effects of smoking attracted nation-wide attention. These investigators found that smoking one cigarette increased the blood sugar content from 30 to 40% during the first fifteen minutes, which condition lasted for half an hour and then came to normal. They suggested that the common observation that smoking alleviates the sense of hunger and "peps one up" was due to this increase in blood sugar.

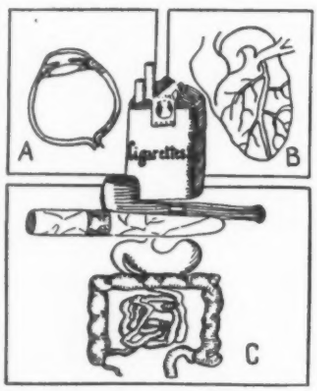


Diagram showing the effect that tobacco has on the body, when used excessively. Nicotine impairs the work of the eye (A); causes conditions of (B) palpitations of the heart; and (C) weakens digestion.*

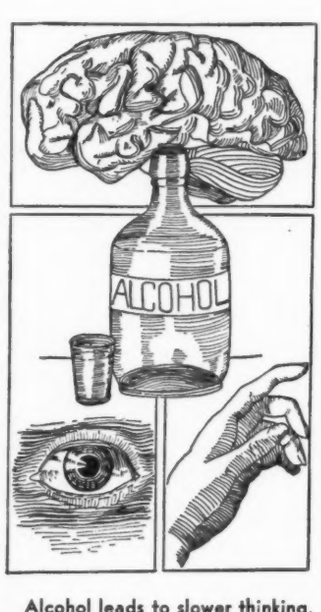
The amount of sugar normally present in the blood is very small. A normal adult has about 1 gallon of blood with 0.1% of sugar, which makes the total weight of the sugar less than four grams, or less than one level teaspoon of sugar. Small as it may seem, this amount of sugar has a great regulating power upon the physiological processes, and a lack of it may cause serious disturbances. When the sugar content drops to below .075% the person is trembling, nauseated, and sweating. Extreme irritability with illogical emotional outbursts and even loss of coordination may be noted. Increased blood sugar content is not accompanied by any marked disturbances because the excess is constantly eliminated with urine.

There is really nothing new in these findings by Haggard and Greenburg. Some other investigators have made similar observations before. In 1928 Andrea found a 30% rise in blood sugar after smoking two cigarettes in fifteen minutes; this condition lasted for two hours. Lundberg in 1930 and Thyselius-Lundberg in 1931 found an increase from 10 to 40% after smoking one cigarette *even without inhaling.*

The earlier observations did not attract much attention, probably because it was published abroad and in stiff scientific magazines. The report of Haggard and Greenberg's work appeared in a semi-technical magazine here and immediately was broadcast by the American press. There are several reasons for such publicity. We may call the present time a cigarette era. About 106,600,000,000 cigarettes were smoked in the United States in 1932, at a cost of $780,000,000 to the smokers. This shows that the capital invested in this industry is enormous. During the last few years there has been a drop of 14,000,000,000 in cigarette consumption as compared with the bumper year of 1930. Since the cigarette manufacturers advertised their products on a large scale and big sums of money were spent for this, newspapers and magazines were delighted to reprint the evidence favorable to smoking, especially because this was furnished by men of science not commercially involved in the advertising. The other reason for a spread of information favorable to smoking is that so many people smoke and always look for some rational excuse for this habit. The smokers are eager to tell others about a scientific "proof" of a beneficial effect of smoking, and thus become active volunteer advertising agents.

Unfortunately for the enthusiastic smokers the situation is not clear or simple. Some other investigators reported different observations. Burstein and Goldenberg in 1928 found no consistency in the effect of smoking on blood sugar, and Ssalischtscheff (Salischev) in 1930 found a decrease of 27% average in ten people.

This revival of interest in the effects of smoking caused Dill, Edwards and Forbes at the Fatigue Laboratory, Harvard University, to carry on some elaborate experiments. The procedure in the experiments was as follows: The subject fasted for ninety minutes and then smoked one cigarette. Four different brands were used. Samples of blood were taken twice before smoking, several times during, and many times after smoking. The blood was tested for sugar and lactic acid. In addition to this the amount of oxygen consumed before and after smoking was also measured. Altogether sixty-nine tests were made. No significant change in blood sugar was found (within 5% from normal). The effect of excessive smoking was also tried on one person. After smoking six cigarettes in two hours, he smoked two more cigarettes and a cigar. The blood sugar remained the same as before the experiment. The subject stated though, that smoking stopped the hunger pangs felt during the latter part of the experiment. This shows that disappearance of hunger after smoking is due to the inhibitory action of the nicotine and not to any increase in the blood sugar content. An ordinary cigarette contains about one gram of tobacco, approximately, and 10 milligrams of nicotine. About one-tenth of this amount may be absorbed by the smoker. The action of nicotine may be noted on an increased heart rate.



Alcohol leads to slower thinking, poorer judgment and more errors in work.*

The amount of the lactic acid in the blood was not affected by smoking, which was expected since there was no increase in the blood sugar. As to the oxygen consumption after smoking, it remained without any change in some persons and was slightly increased in the others. This may serve as a warning to those who have a morning appointment with a doctor for a metabolism test, since it may give a higher oxygen consumption during the test and thus mislead the doctor.

To summarize briefly, smoking seems to give no assurance that it will produce an increase in the blood sugar, and a cigarette cannot be considered a supercharging smoke stack. The "lifting" power derived from a cigarette by some hockey players, aviators and travelers should be measured in terms

*Illustrations from *We and Our Health*, Book IV, by E. George Payne and John McCarthy, M.D. Used with permission of the publisher, the American Viewpoint Society, New York.

of dollars rather than in terms of sugar. At any rate the smokers should look for some different and better excuses.

Alcohol and muscular work

Many people sincerely believe that alcohol is a good and reliable source of energy. Give some whisky to a timid, sluggish, tongue-tied individual and a miracle will be observed. The man will be immediately transformed: he will dispense with his timidity, will become aggressive to the point of annoyance, and talkative to the degree of insanity. Of course these are two extreme stages, but how about some intermediate stages? Is it not possible to give some alcohol as a stimulant or as a source of concentrated energy to an athlete just before he engages in strenuous exercise? This has been tried. In some sports (rowing) it was almost an inviolable ritual. A glass of sherry with yolk of an egg was given just before a race. This custom has long since been abandoned inasmuch as results were contrary to expectation. It has also been tried in other sports, boxing for instance, but has never proved to be advantageous. Once when I refereed an amateur boxing match, my attention was attracted by somewhat aromatic exhalations of one of the contestants. I politely asked him if he were feeling well. He replied "Oh, you noticed my hair tonic?" The match did not last very long. The user of the "hair tonic" was soon helped back to the dressing room. Later he confessed that it was his first boxing match, and feeling scared stiff, he had taken a drink. That this made him courageous, there was no doubt, but it was a foolish kind of courage, disregarding even the rudimentary means of defense, and therefore he did not last more than the second round.

To state that the use of alcohol lowers the keenness of judgment will be a repetition of a well known fact, which is frequently illustrated by automobile accidents. Now suppose a man is doing some work where no particular keenness of judgment is necessary. Is it not possible for him to drink some alcohol and utilize it as a fuel for the muscular work?

On the surface it looks quite plausible. Every gram of alcohol on oxidation gives off about eight calories of heat—twice as much heat as from the same amount of sugar. This question puzzled many scientists, and the answers given were rather in favor of alcohol.

About two years ago Carpenter, Lee and Bourdet from the Carnegie Nutrition Laboratory experiments on human beings. The persons performed some standard exercises, lasting sometimes for two hours. The amount of oxygen necessary for maintenance of this work was then measured (by subtracting the amount of oxygen used during period of rest from the amount of oxygen used during work, in the same period of time). Then the person was given 50 cc of absolute alcohol in water, which is equivalent to one-half cup of whisky, and the amount of oxygen used by him at rest was found. Then he exercised and the increase in oxygen con-

[Concluded on page 39]

Coaching School Directory

The following schools had announced their 1935 summer sessions at the time this issue went to press. As more schools are announced they will be added to the Directory in the May issue of Scholastic Coach:

BUTLER UNIVERSITY—Indianapolis, Ind. Aug. 12-17. Paul D. Hinkle, director.

COLGATE UNIVERSITY—Hamilton, N. Y. William A. Reid, director.

COLUMBUS COACHING SCHOOL—North High School, Columbus, Ohio. Aug. 26-31. Arthur C. Jones, director.

UNIVERSITY OF DENVER—Denver, Colorado. June 17-29. Percy P. Locey, director.

DUKE UNIVERSITY—Durham, North Carolina. July 15-20. Wallace Wade, director. See advertisement this page.

UNIVERSITY OF ILLINOIS—Urbana, Ill. June 17-July 27. Seward C. Staley, director.

INDIANA UNIVERSITY—Bloomington, Indiana. June 19-July 16. Z. G. Clevenger, director.

UNIVERSITY OF IOWA—Iowa City, Iowa. June 10-July 18; July 22-Aug. 22. O. M. Solem, director.

KANSAS STATE HIGH SCHOOL—Topeka, Kansas. Aug. 12-23. E. A. Thomas, director, 315 West 10th street.

LIEB-MEANWELL COACHING SCHOOL—Pio Nono High School, Milwaukee, Wisconsin. Aug. 26-31. E. T. Dermody, director. See advertisement next page.

MISSISSIPPI STATE COLLEGE—State College, Miss. Dates to be announced. R. P. Patty, business manager.

UNIVERSITY OF MISSOURI—Columbia, Missouri. June 10-Aug. 2. C. L. Brewer, director.

UNIVERSITY OF NORTH CAROLINA—Chapel Hill, North Carolina. Aug. 19-31. R. A. Fetzer, director.

NORTHEASTERN UNIVERSITY—Boston, Mass. June 24-29. Edward S. Parsons, director. See advertisement on page 23.

NORTHWESTERN UNIVERSITY—Evanston, Illinois. Aug. 12-24. K. L. Wilson, director.

OHIO UNIVERSITY—Athens, Ohio. June 10-July 6. O. C. Bird, director.

PENN STATE COLLEGE—State College, Pennsylvania. July 22-Aug. 10. See advertisement this page.

SPRINGFIELD COLLEGE—Springfield, Mass. July 1-Aug. 3. Regular summer session, phys. ed. and coaching. G. B. Affleck, director.

STATE COLLEGE OF WASHINGTON—Pullman, Washington. June 17-July 12. J. F. Bohler, director.

TEXAS TECH—Lubbock, Texas. Aug. 5-16. P. W. Cawthon, director. See advertisement this page.

UTAH STATE AGRICULTURAL COLLEGE—Logan, Utah. June 10-15. E. L. Romney, director.

UNIVERSITY OF WISCONSIN—Madison, Wisconsin. July 1-Aug. 9. Walter E. Meanwell, director.

School Archery Tournament by Mail

THE first interscholastic archery mail tournament will be held next month, between May 5 and 15, under the sponsorship of the Interscholastic Archery Association, a year-old organization started by the late Philip Rounsevelle. Isophene Swendsen, 851 Dayton avenue, St. Paul, Minn., secretary of the association, is receiving entries from member schools. The term "interscholastic" is used by the association to include colleges as well as high schools and other secondary schools.

The competition will be conducted in two classes: Class A, for men or women from college, junior college, university or military schools of college rank; Class B, for boys or girls from high schools, junior high schools, or military schools of secondary school rank.

Other regulations include:

ROUNDS TO BE SHOT—Class A, Men: American Round (30 arrows, or five ends, at each distance of 60, 50 and 40 yards)

Women: Columbia Round (24 arrows, or four ends, at each distance of 50, 40 and 30 yards).

Class B. Boys: Jr. American Round (30 arrows, or five ends, at each distance of 50, 40 and 30 yards).

Girls: Jr. Columbia Round (24 arrows, or four ends, at each distance of 40, 30 and 20 yards).

TEAM SHOOT—Class A, Men: 60 arrows (ten ends) at 60 yards.

Women: 60 arrows (ten ends) at 50 yards.

Class B, Boys: 60 arrows (ten ends) at 40 yards.

Girls: 60 arrows (ten ends) at 30 yards.

Team membership is limited to four members on one team, and each school is to enter only one team.

RULES FOR COMPETITION—This tournament must be shot under usual competitive conditions. Scores are to be checked by two people, i.e., target scorer and archery coach(or person officiating).

The tournament must be shot out of doors at a regulation 48" target.

Indoor equivalents will not be accepted.

A person may shoot both in the individual tournament and in the team tournament.

AWARDS—A certificate will be awarded to each entrant at the end of the tournament which will show how he placed.

In each class three medals will be awarded; gold for first place, silver for second place, and bronze for third place. (This means twelve medals.)

A trophy will be awarded to the winning school or college of each class team shoot. (This means four trophies.)

A Key To Schedule Making

THE following key for schedule making, suggested by Hubert G. Johnson, Supervisor of Athletics, Detroit Recreation Department, Detroit, Mich., has been issued as one of the bulletins of The Athletic Institute, Inc., 209 South State Street, Chicago, and is made available to Scholastic Coach readers through the courtesy of C. O. Brown of that organization.

All schedules are made for an even number of teams. If the number of teams is odd, simply add one to make the number even. Then take the highest number and every time a team is scheduled against that particular number, it has the bye.

directly below it the number which was the top one in the right hand column of the preceding week. Then write the numbers down, then up, in exactly the same order as the preceding week—in this instance, 1, 8, 2, 3; then up, 4, 5, 6, 7.

For the third week, follow the same plan—keep "1" where it is and use what was the top number on the right hand column for your next number, "7"—then proceed as for the second week.

An inspection of the example below will make this clear. There will always be one less bracket of games than there are teams. If, by mistake, you write too many brackets, the eighth one for eight teams will be the same as the first one, so the mistake will be apparent. Then simply substitute names of teams for the numbers and your schedule is complete.

To avoid the charge of arbitrarily pairing certain teams against each other, place the names of all teams in a hat, number them in the order in which they are drawn and substitute the names for the numbers in the pairings.

For eight teams (or seven):

*1 — 8	1 — 7	1 — 6	1 — 5	1 — 4	1 — 3	1 — 2
2 — 7	8 —*6	7 — 5	6 — 4	5 — 3	4 — 2	*3 — 8
3 — 6	2 — 5	8 —*4	7 — 3	6 — 2	*5 — 8	4 — 7
4 — 5	3 — 4	2 — 3	8 —*2	*7 — 8	6 — 7	5 — 6

*Shows team which lies idle or has "bye" if schedule is for seven-team league.

The example above is for eight teams but applies equally well for fifty, if necessary. Number the teams and write one column *down*, using half the numbers, in this instance, 1, 2, 3, 4; then write the next column *up*, using the rest of the numbers, 5, 6, 7, 8.

To write the next and subsequent weeks, keep the number "1" where it is, but place

School Swimming Records Broken

INTERSCHOLASTIC swimming records broken during the past season, for which application for acceptance by the Swimming Records Committee had been made at the time this issue went to press (April 1, 1935), have been listed for Scholastic Coach by Philip S. Harburger, chairman of the Committee, as follows:

Pools 75 Feet in Length but Less Than 150 Feet

50 yards . . . . . 23 6-10s. Matthew Chrostowski, Providence Central High School at New Haven, March 16, 1935.

50 yards . . . . . 23 8-10s. W. H. Farnsworth, Mercersburg Academy, at New Haven, March 16, 1935.

100 yards . . . . . 53 2-10s. Matthew Chrostowski, Providence Central High School, at Cambridge, February 2, 1935; at New Haven, March 16, 1935.

100 yards Breast Stroke . . 1m. 4 2-10s. John Higgins, Providence Central High School, at New Haven, March 16, 1935.

100 yards Breast Stroke . . 1m. 4 6-10s. John Higgins, Providence Central High School, at New Haven, March 16, 1935.

100 yards Breast Stroke . . 1m. 4 8-10s. John Higgins, at Cambridge, Feb. 2, 1935.

300 yards Medley Relay . . . . 3m. 10s. Province Central High School (Chrostowski, Higgins, Soltysiak), at Cambridge, Feb. 2, 1935.

300 yards Medley Relay . . 3m. 10 2-10s. Providence Central High School, at Pawtucket, Feb. 15, 1935.

300 yards Medley Relay . . 3m. 12 8-10s. Mercersburg Academy (Mackey, Johnson, Otis), at Mercersburg, Jan. 26, 1935.

Pools 60 Feet or Over but Less Than 75 Feet

100 yards . . . . . 53 3-10s. Edwin Sabol, Blair Academy, at Blair, Jan. 19, 1935.

100 yards Back Stroke . . . . 59 8-10s. Adolph Kiefer, Roosevelt High School, Chicago, at Evanston, Illinois, March 2, 1935.

100 yards Back Stroke . . . . 60 2-10s. Adolph Kiefer, Roosevelt High School, Chicago, at Evanston, Illinois, March 1, 1935.

300 yards Medley Relay . . 3m. 8 3-10s Mercersburg Academy (Mackey, Johnson, Otis), at Annapolis, March 9, 1935.

Basketball Coaches Meet

The annual meeting of the National Association of Basketball Coaches was held in Chicago, April 3, 4 and 5. A full report on the meeting, with emphasis on technical points of the discussions and demonstration games, will appear in the May Scholastic Coach, written by George R. Edwards, secretary of the association, and basketball coach at the University of Missouri.

Why Putts Go Wrong

[Continued from page 21]

Why putts go to the left.

Though it is not considered good pedagogy to teach by showing how not to do it, the instructor should know the causes of certain errors even though he does not point them out to his pupils. I never show a pupil what he is doing wrongly, unless he is so far advanced that I know it will do him no harm, and even then I am reluctant to do so.

It is a fact that most missed putts go to the left of the hole, and the cause of this is shown clearly in the pictures, Series A (page 17). The path of the clubhead tells the story plainly. This player made no effort to swing his putter along the line and as a result the club, following its natural arc, swung inside the line, pulled the ball to the left, and another putt went wrong. The remedy for this is, of course, pictured in Series C—swing the putter along a straight line to the cup.

Why putts go to the right.

Watch carefully for the error shown in Series B. Here the putter has been swung across the line to the outside, thus pushing the ball to the right of the cup. When you see a pupil make this error, you can be quite sure you have met Mr. Tension. The pupil who does this consistently usually realizes the importance of swinging along the line but in his anxiety to do so he permits tension to tie up his wrists, preventing the accurate guiding of the putter. You may help him relieve this tension by suggesting that he make the stroke with the right hand, subordinating the left as much as possible. This is a subtle method of getting him to relax his wrists without going to the opposite extreme of flabbiness.

You will not be concerned however with putts to the left or right if you insist on getting results as shown in series "C." That's how putters are born!

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A.P.E.A. Convention This Month

The annual convention of the American Physical Education Association will be held April 24-27 at Pittsburgh, Pa. The year 1935 marks the fiftieth anniversary of the organization and its fortieth annual convention. The theme of the Golden Anniversary Convention is—*Health and Physical Education in the New Social Order.*

Raging Controversy

By Jack Lippert
Editor, Scholastic Coach

OUR decision not to call a foul on No. 3 (see cut below and sequel on opposite page) either for face-guarding or for blocking (if, in turning to cover 1, 2 should collide with 3) has brought down a storm of protest on our editorial head.

"It is just as well you are not refereeing *our* games," wrote one correspondent. "We always thought you were a ham referee, and now we are

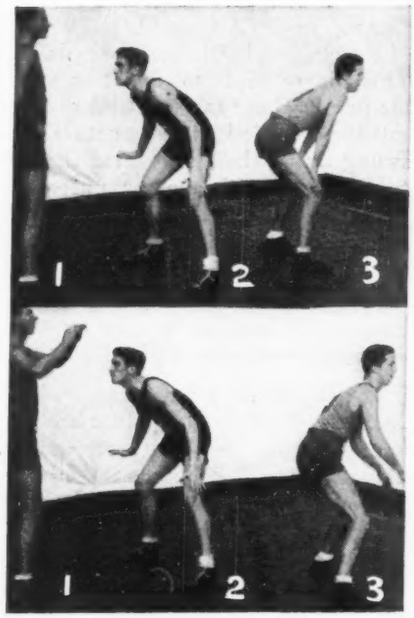


EXHIBIT A
Is 2 Face-guarding 1?
Is 3 about to block 2?

sure of it," wrote another, in a kindlier tone.

Mr. Earl E. Olson, who started it all in the first place (See Complaint Dept., page 5, March, 1935, Scholastic Coach), now writes in to say that he was not referring to 3, but was raising the question of the legality of 2's maneuver. Mr. Olson maintains that, according to a strictly technical interpretation of the face-guarding rule (Rule 7, Sec. 13) 2 is face-guarding 1. The rule:

> "Face-guarding takes place when a player disregards the ball and faces an opponent, *thereafter* shifting his position as the opponent shifts, thus obviously interfering with the latter's progress."

The italics for "thereafter" are ours, for on that word hangs Mr. Olson's argument. He has a good argument, technically. No. 2, disregarding the ball, faces his opponent, No. 1. No. 2 does not shift until 1 gets the ball, so

up to that point 2 is not guilty of face-guarding. But *thereafter* 2 shifts. Is he guilty of face-guarding? The rule, no doubt, was never intended to apply after the player came into possession of the ball. The point Mr. Olson raises may result in clarifying the phraseology of this section.

Mr. John Murray, the noted eastern referee, who has high ideals about basketball, says that we are most certainly in error in not calling a personal foul on 3 if a collision occurs between him and 2 when the latter turns to cover 1. "Even though 3 stands perfectly still, I would call a personal foul on him for blocking if 2 collided with him, and I was satisfied that it was 3's *intent* to screen 2," said Mr. Murray.

It is hard enough to detect intent

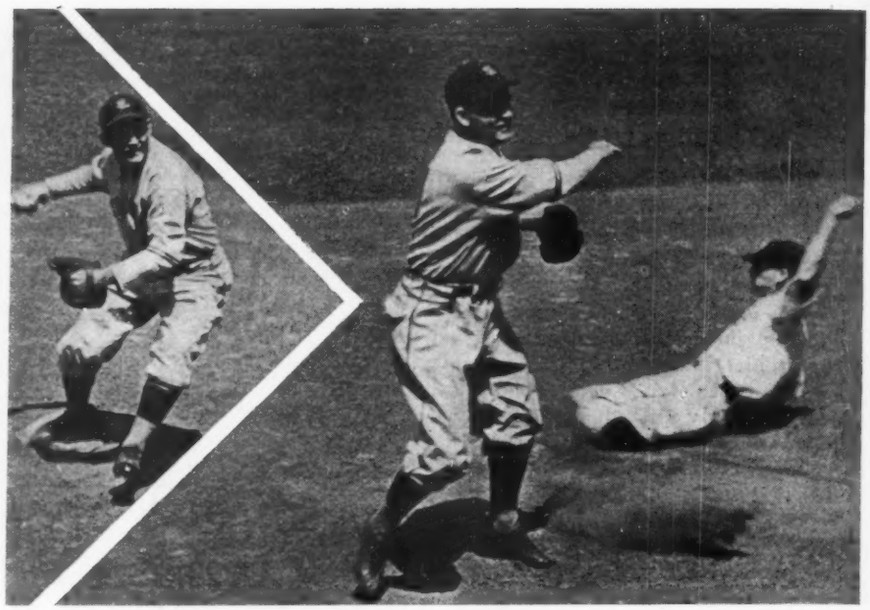
EXHIBIT B

when the players are before you in the flesh, let alone trying to do it with pictures of them. However, if we were thinking of intent at all it was that 3's intent was to receive a pass from his teammate who has the ball out of bounds under his own basket. As you will notice in Exhibit A, 3 goes to put up his hands, but, as it developed in the full series of these pictures (February, 1935, Scholastic Coach, page 23), he was only *pretending* to receive the pass, in order to deceive his guard (who, like Mr. Murray's intent, is not in the picture). Instead, the pass (a fast, high one) goes to 1, who plays "dummy" until the ball is virtually in his hands.

Now, we may be naive in supposing that 3's intent was to receive the pass from out of bounds, but it is still our contention that in view of the fact that he was directly facing the ball and certainly in a most excellent position to receive a bounce pass, or handle the ball in some manner, we would be willing to give him the benefit of the doubt. That is to say, we would not invoke the "intent" clause of the blocking rule to his disadvantage. There is too much of a possibility of his intent being something else.

The "intent" clause appears in the supplement "Comments on the Rules" by Oswald Tower, and says:

"A player is entitled to take any position on the court not occupied by another player, [Concluded on page 40]



Hornsby crossing second base on a double play, and making his throw to first so that he is not interfered with by the runner

From the film "Play Ball." (See footnote page 13.)

Baseball from Big Leaguers

[Continued from page 13]

for not knowing the batting habits of the opposing team, there is no excuse for not knowing what your pitcher intends throwing to each batter.

If you know that a right-hand batsman is likely to hit a fast ball a trifle late and toward right field, you must edge over toward first base just as you would for a left-hand hitter with a tendency to pull a ball toward right. A right-hand batter also will hit a curve ball on the outside toward right field while a left-hand hitter will hit a curve ball on the opposite side of the plate toward left field. If a slow ball is thrown up to a right-hand hitter, play closer to second.

Play the ball. Do not let the ball play you. The short hops are the toughest, so try to grab the ball, if possible, on the long hop.

Charge in for a slow hit grounder, and cultivate a snap underhand throw to first, for there are times when nothing else will beat a fast runner to the sack.

When you are playing deep for a hard right field hitter and the ball comes to you sharply and perhaps on the desired long hop, a side arm or overhand throw is in order.

The second baseman, like all players on the team, must cooperate with those next to him on the defense. Thus, the second baseman must have a working agreement with both the shortstop and first baseman. Now and then you may have to cover first when the first baseman has been drawn wide on a grounder. You must have an imaginary line drawn defining the areas which you are expected to cover on the one side, and the first baseman on the other. You must also have it understood with the shortstop as to whether you or he will cover second base to take the throw on an attempted steal.

You must have a change of pace in throwing to the shortstop in starting a double play. Sometimes you set yourself and make a careful throw. Do not *shoot* the ball to your teammate if a short throw is all that is necessary. In such a case, toss or lob it. Sometimes, you may have to make a back hand flip to get it there in good time.

Being the pivot man in a double play can be easy or tough. It is a cinch for the base runner to break it up if the second baseman fails to go through with his part of the work properly. The proper way is to take the ball a step away from the bag, tag the sack with the left foot, take one more stride, and thus be in a position to whip the ball to first without being spilled. If you stand on the bag when taking the throw, the runner may take you out of the play, either by knocking your feet out from under you or by coming in standing up and preventing you from making your throw to first.

How do the crack second basemen of the major leagues tag a runner? By standing just outside the base line, perhaps two feet from the sack, and tagging the runner as he comes sliding in, endeavoring to let him retire himself, if possible, by sliding into the ball. They tell me Napoleon Lajoie, one of the greatest second basemen in the history of the game, used to grab the ball with one hand and nail the runner with a sweeping motion. But, there have been few Lajoies. The safer way is to catch the ball in both hands before attempting to put it on the runner.

SHORTSTOP

By Joe Cronin

Boston Red Sox

IN a way, the duties of the shortstop are like those of the second baseman. I would say, however, that the shortstop should be more agile and able to throw overhand, sidearm or underhand. If I have to take a ground ball to my left, I must whip it underhand or sidearm to first. If I have to go to my right or back in deep short, I throw overhand and rifle it.

The shortstop must make longer throws than any other infielder. He also must be fast enough to show speed in coming in for the slow rollers which, often, he must grab with one hand and throw underhand.

The shortstop cannot be a spectator. He not only must cooperate with the second and third basemen as to the territory to be covered, and have it understood who is to cover second on an attempted steal, but he has many other duties.

He must be skillful in taking short flies to left or center field with his back to the plate. He must back up the second baseman when the latter is taking a throw from the catcher. He must cover second when the ball is hit sharply to the first baseman and there is a chance for a double play with the shortstop acting as the pivot man. He must cover third base with the third baseman backing him up on a throw from right or center with a chance to nail a runner going from first to third. On many teams he takes the signs from the catcher and relays them to his teammates.

The shortstop should be taught to pivot differently than the second baseman in a double play. I have two ways to prevent the runner from spilling me or spoiling my throw. As I take the throw from the second baseman, I have one eye on the runner coming from first. If I see he is coming in on the inside or third base side of the sack, I tag the bag with my right foot, take one more step and throw. If the runner is crashing in on the outside, I tag the bag with my left foot, make a quick step backward and then throw. In taking a throw from the first baseman with a double play possible, I generally allow myself to be similarly governed by the runner's actions.

THIRD BASE

By Willie Kamm

Cleveland

NOW that we have so many star left-hand hitters in the big leagues, the term "hot corner" does not carry the meaning it once had. The balls still come down that line sizzling with fiery speed, but they appear less frequently than they used to. I have no statistics on this subject, but it seems to me the hot corner has lost some of its heat. Be that

as it may, the job is no sinecure, and when things happen around my station they happen fast, and are usually mighty important—especially if a baserunner approaching third, or on third, is involved. There are no stops between third and home, and if we don't get the runner at my station there is only one more check on him.

The third baseman has an understanding with the shortstop on territory to be covered. He also reaches an understanding with the pitcher as to the handling of bunts on his side of the diamond. It would never do for both pitcher and third baseman to essay to field the bunt with a runner on second. In such case, the pitcher might grab the ball and find no one covering third. Now and then, certain conditions may exist when the shortstop is able to move over to take the throw from either the pitcher or third baseman, but it is very seldom that the situation is favorable for this.

The third baseman will shift his position as a result of his knowledge of the batter and what his pitcher is going to throw the batter. To take a big-league instance, say we have Al Simmons of the White Sox at bat. Although Simmons is a right-hand batsman, fully half of his hits are to right field or right center. That is because the pitcher, in an effort to prevent him from pulling the ball into the left field stands, feeds him offerings on the outside. Naturally, I cannot get the sign direct from the catcher as to what the pitcher is going to throw, so I get it from our shortstop. If I learn that the ball is going to be on the outside, I say to myself: "Bill, you can take it easy for a moment if the pitcher pitches as directed." But, the pitcher does not always do so. Sometimes his control is off, and it does not pay, even among the best baseball company in the world, to take anything for granted.

Now, if I am tipped off that the pitch to Simmons or a similar hitter will be a curve ball on the inside, I set myself for a hot drive close to the third sack.

Suppose Earle Coombs, a left-hand hitter, were at bat. If I get the sign that the pitch will be on the outside, I know I must play close to the foul line if I am going to field the sizzling drive he may hit.

Having had fair success in tagging runners, I would say that the best results are acquired by straddling the bag with both feet on the foul line and holding the ball so the runner will slide into it. By thus straddling the sack, the third baseman is able to tag the runner aptly whether he tries to hook the bag with his right or left foot. Should the third sacker stand on either side of the cushion, the runner might be able to hook the opposite corner and slide in safely.

In throwing to first base from close to third, use the throw most natural, but when fielding bunts or slow rollers for which the third baseman must come in, the sidearm or underhand system must be used as there is no time to straighten up to make the overhand shot.

FOOTWORK OF THE CATCHER

By Alfred Kunitz

What the arm does depends a great deal on the efficiency with which the feet shift

Mr. Kunitz is baseball coach and instructor in the department of health and physical education of Richmond Hill High School, New York.

THE catcher whose throwing is respected so little by opposing baserunners that they steal bases as they please, is no catcher at all. He is a backstop. A good throwing catcher is worth his weight in paraphernalia, and the high school coach who has a boy behind the mask who can throw them as well as stop them is indeed fortunate. The pace of the whole team defense hangs on the catcher's arm.

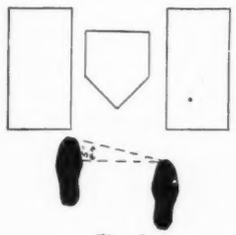


Fig. 1
Recommended Stance

The position of the feet while waiting for the pitcher to deliver the ball can materially affect the catcher's throw. The manner in which the feet are placed can either speed up or impede body action. The stance is the foundation of the throw. What is the best foundation?

I have found that young catchers derive much more from the potentialities of body balance and weight shift when they take a stance with the left foot slightly (4 to 5 inches) in front of the right than they do when they keep their toes in a line. Our catchers are coached to squat and rise from this position with the left foot advanced. (Fig. 1.) It makes for a more comfortable squat and one in which they have better balance and are less likely to sway or jiggle. This stance allows for just that slight difference in weight transference which expedites the shift of feet and body into throwing position.

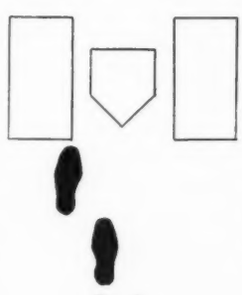


Fig. 2
Shift to the Left

The catcher should continue to keep his weight forward after he has risen from the squat position and is up and ready to handle the pitch. Of course, while he is down in squat, the weight is well forward of sheer necessity, if the catcher is to maintain his equilibrium. But after the catcher is up there is a tendency to let the weight shift back to the heels. While the heels will be touching the ground, the weight should be kept well off them. With the weight forward, the catcher, "on his toes," profits to the extent of being able to shift more rapidly for the balls that do not come right to the spot where he wants them, and for the fielding of bunts and flies.

Perhaps the most difficult mechanic involved in throwing quickly is the ability to shift in front of a pitched ball and at the same time maneuver the body into the best throwing position. No less a baseball authority than Stanley "Bucky" Harris, former manager of the Detroit Tigers and present manager of the Washington Senators, stresses the important relationship that exists between the catcher's shift and his throw. In his book *Baseball — How to Play It**, Harris says, "An ability to shift rapidly into throwing position is very essential. For this reason a catcher should invariably be on his toes."

The inexperienced catcher should make it a habit to shift in front of every pitched ball. The shift can always be executed unless the pitch is wild. In the case of a wild pitch the first duty of the catcher is to stop the ball, shift or no shift. Even in an effort to stop a wild pitch it is sometimes feasible to employ the shift. In order to get in front of a ball thrown to his left the catcher should use the following shift: by means of a hop the right foot is shifted directly behind the left and simultaneously the left foot is shifted into throwing position. (Fig. 2.)

A more difficult shift to execute, and one which gives catchers the most trouble is the ability to get in front of a ball thrown to the catcher's right. Any ineptitude in the catcher's performance of this shift is the cause of a great many fielding and throwing deficiencies. Unless a catcher can skilfully shift to his right he will be handicapped in throwing quickly and will be charged with many passed balls. The best way to shift to the right is for the catcher to lunge sideward with the right foot. This act is usually sufficient to bring the body in line with the ball. The left foot, free of weight, is shifted forward into throwing position.

When a ball is delivered to the catcher in strike area—over either corner of the plate, or over the middle of the plate — another type of shift comes into use. This shift entails movement of the left foot only. The instant the ball is caught or just before, the left foot shifts into throwing position.

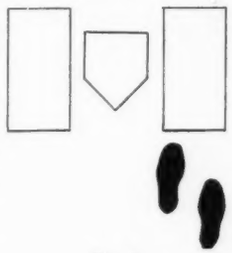


Fig. 3
Shift to the Right

The Arm

The action of the catcher's arm must be perfectly timed with his shift. The instant the left foot moves into throwing position the ball should be brought directly to a point close to the ear. (See cut on page 5.) Do not move the arm downward and backward and then upward to bring it into throwing position. This fault has ruined many likely prospects. The ball should be released from its position close to the ear with a wrist snap and the throwing coordination of all parts of the body

The short arm action and the wrist snap enable the catcher to get off his throws quickly. The catcher does not have to draw his arm way back in order to get power into his throw. The wrist snap cuts the time required for a catcher to throw the ball to a baseman ahead of the runner.

Improving the Throw

Getting a firm grip on the ball helps to secure an accurate throw. Do not attempt to withdraw the ball from the mitt the instant it is caught. Instead, the ball should be permitted to rest in the mitt where the throwing hand can firmly grip it. The glove meanwhile is not permitted to rest where the ball was caught. The ball and glove are quickly brought to the height of the chin, where the ball is removed sharply from the mitt [Continued on page 38]

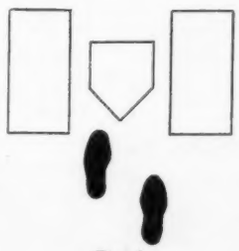


Fig. 4
Strike Area

*Harris, Stanley: *Baseball, How To Play It*—F. A. Stokes & Co., New York, 1925.

Here Below

[Continued from page 7]

exploited for money-making purposes. No person with intellectual honesty or moral integrity will touch him with a ten-foot pole for any purpose or to gain any end. Unless those who represent American scholarship, science and the right of a free people to discuss public questions freely stand together against his insidious influences he will assassinate them individually by every method known to yellow journalism—only cowards can be intimidated by Hearst."

Free athletic inquiry

WORD comes from Charles H. Kauffmann, executive secretary of the Virginia High School Literary and Athletic League, announcing the question to be debated by member schools during the 1935-36 season. It is: Resolved, that interscholastic athletics should be abolished in the public high schools of Virginia.

Rough or smooth?

TENNIS is a game that lends itself admirably to the objectives of secondary school education. It needs no apologists, for its place in the school program today is everywhere acknowledged. In an attempt to meet the demands of high schools for material which will enhance student-interest in tennis and serve as practical aids to the learning of the game, Scholastic, the American High School Weekly, and Scholastic Coach have for many years been publishing instructional material on the game. In this issue, on pages 14 and 15, appears a series of continuous-action pictures of four of the world's leading players, taken by Owen Reed of our own staff. These rare pictures would no doubt interest the general student body, and we suggest that you post them on your bulletin board.

Further stimulus to the tennis movement in high schools has come in recent years from the National Scholastic Tennis Tournament, a plan by which any high school in the United States may have for the asking medallions of small intrinsic value to award to the winners of intramural tennis tournaments, both boys and girls. A letter of application, addressed to Tennis Editor, Scholastic, 250 East 43rd Street, New York, N. Y., will bring the medallions, packed in presentation boxes, by return mail. Or, the coupon on page 40 may be used. Immediate application is advised, for the number of trophies is limited to 2,500 schools.

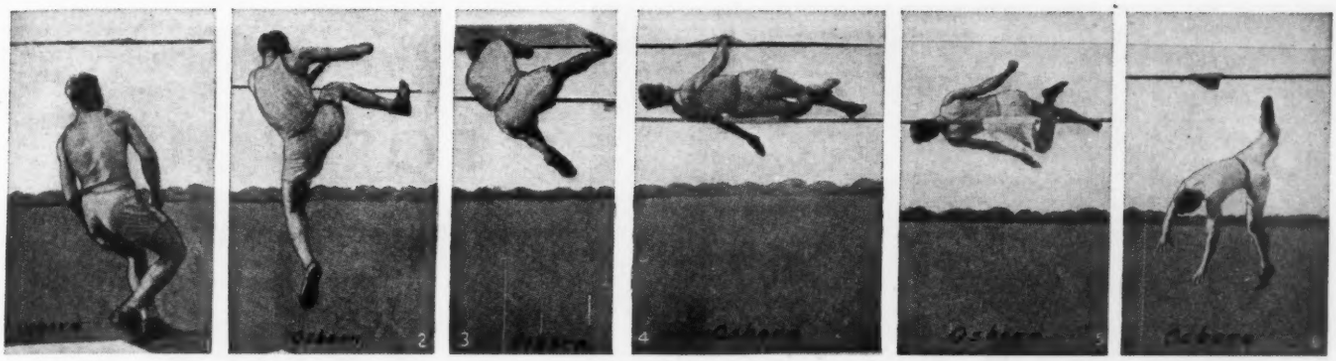


Illustration VI. Osborn sequence from *High Jump*, American Sports Publishing Co.

Illustrating the Osborn sequence.—No. 1 shows the well emphasized "gather," or preliminary spring, which comes just before the rise. Note the position of the left knee. A suggestion of the turn is already noticeable for the body inclines slightly to the left and rear. The actual kick differs from the orthodox style, for here we find that Osborn lifts his knee first and at the time he leaves the ground with his left or take-off foot, that leg is fully extended, while the free leg is still a direct knee lift. This knee action is still evident in No. 2, but is changed to an outward-and-upward reach or kick, as shown in No. 3. The right arm aids the upward lift more than the left arm. This is only natural, as the turn has been started and the right arm action must take and hold this precedence. In No. 4 the jumper is parallel with the bar. The right leg does not show the same finish that has been pointed out in one of the pictures. The left arm-and-shoulder action is quite evident in this illustration. In No. 5 the leg-and-shoulder action has definitely started the jumper downward but the right leg at this time should show an inward and outward lift, as this sort of action, if correctly timed, will throw the jumper away from the bar and at the same time facilitate the turn.

Mechanics of the high jump

[Continued from page 12]

ters, was particularly of this type, having very long but slender legs.

Explosive Power of Muscle Fibers is Basic Cause of Muscle Force. One of the most basic considerations is the psysico-chemical behavior of the individual muscle fibers. Understanding what makes the fibers contract may lead to a clearer understanding of the way in which the all-important projection force originates.

It is clear that the shortening of striated muscle is due to the combined effect of the contractions of the individual fibers. The contractile elements are these fibers, minutely small, 1 to 40 mm. in length and 10 to 100 microns in diameter. The actual shortening does not originate in the covering (sarcolemma) or in the fluid within (sarcoplasm) but within microscopic nuclei called sarcostyles which cause the striated appearance of muscle tissue. Not all muscle tissue is alike in quality. It varies among individuals and also among the different muscles in a single body. The most resistant fibers to fatigue and also the ones which can contract most swiftly are the pale, clearly striated fibers, such as those found in the diaphragm. The red type of muscle fibers are more forceful but contract more slowly and are subject to relatively quick fatigue. An interesting point is that the calf muscles (soleus), so important in running and jumping are of the red type and also among the least efficient for speed and endurance of all the muscle fibers in the body.[15]

The muscle fibers must be aroused to action by the electrical nerve stimulus which plays the role of the spark which sets off the explosion, similarly to the spark in an automobile igniting gasoline. The stimulus is under control of the brain cells. A greater stimulus causes a more powerful total contraction of the muscle but does so by setting into operation a larger number of fibers rather than causing each fiber to contract more. Each fiber is like a small percussion cartridge, it fires or it does not fire. The contraction force of each individual fiber (which determines the quality of the muscle) is governed by the chemical make-up of the fiber and the amount of combustible food present. Certain proteins must be present in the fibers for them to be in good condition and there must be ample glycogen available to fill the role of explosive powder. *The initial energy of muscular contraction is derived from splitting phosphogen to produce phosphoric acid and creatine under the influence of the electrical stimulation.* The original source of the energy seems to be glycogen (sugar), although there is some evidence that other substances, such as fats, are burned also but not as economically as the carbohydrate material.

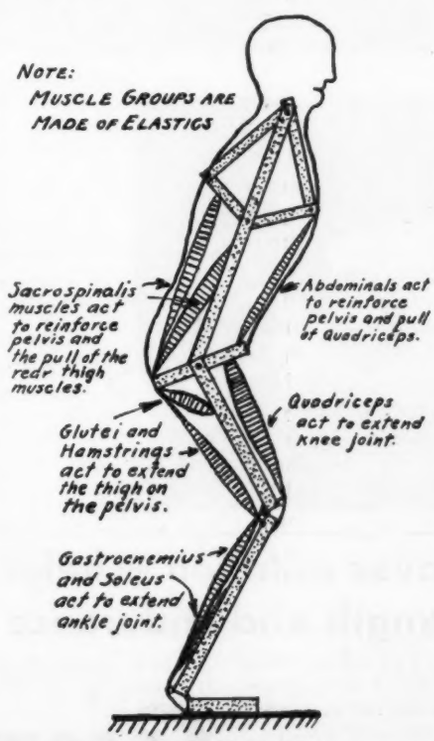


ILLUSTRATION VII
Model to Illustrate Muscle Action in Jumping

There are several theories which attempt to explain why shortening accompanies stimulation and combustion within the individual fibers. There is an optimum speed of shortening for each muscle to produce the greatest power in a given time. *It is important to realize the mechanism which limits the speed of contraction of muscles in men is inherent in the fibers and depends upon nutrition and conditioning and is not under the immediate control of the will.* While pale fibers are thought to contract faster, the principal physical condition which limits the speed of any type of muscle contraction is the viscosity or relative fluidity of the muscle. All runners and jumpers can do is to favor these conditions by careful training.

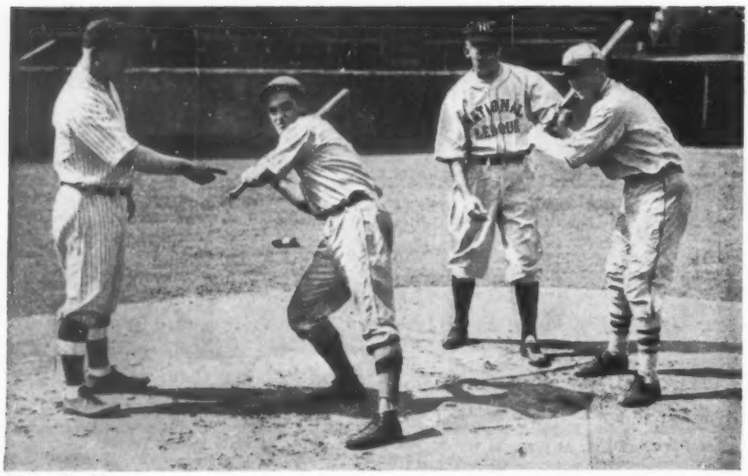
Other factors—In addition to the mechanical factors of high jumping there are other factors chief among which are:

1. Mental drive to study, practice and compete with confidence and determination.

2. Organic condition which must be favored by rest, sleep, good food, and careful adherence to personal hygiene in general with avoidance of harmful influences.

3. Sufficient time to reach the peak of physical development and neuro-muscular learning. One cannot help but see from the personal history of great jumpers that this is a matter of several years of persistent endeavor at the minimum.

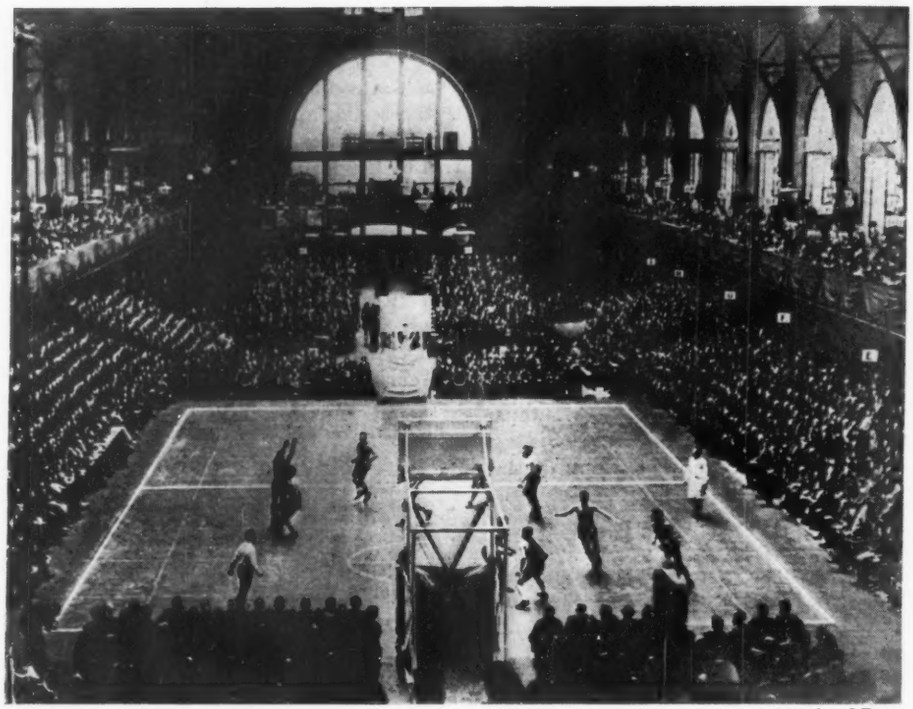
[15]Schneider, E. C., "Physiology of Muscular Activity," W. B. Saunders Co., 1933.



Wide World

FOR YOUR BULLETIN BOARD

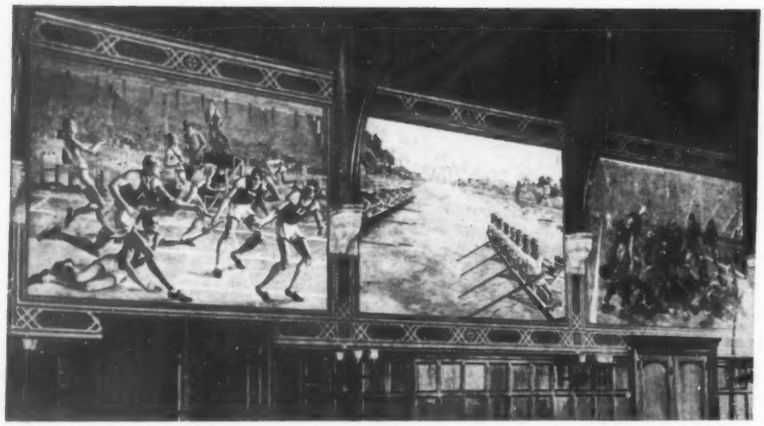
ABOVE—THE BAD AND THE GOOD IN BATTING STANCES: A lesson at the baseball school conducted by the National League at Miami last month. At the left, Leslie Mann pointing out the error of his recruit's way. At the right, Max Carey adjusting a pupil to the proper stance, with the bat off the shoulder and the weight on both feet.



Associated Press

RIGHT—WHEN THE ARMY AND THE NAVY MEET IN BASKETBALL: The scene at Annapolis this year when the West Pointers defeated the Midshipmen, 35 to 26. This picture was taken just as Army let fly a 25-foot field goal over the Navy man-to-man defense.

Keystone



LEFT—THREE OF THE THIRTEEN PANELS OF THE ATHLETIC MURAL RECENTLY UNVEILED AT PRINCETON: The track, crew and football paintings by William Yarrow in the trophy room of the Princeton gymnasium. The track panel is the artist's conception of a relay race, in which Princeton, in the post position, takes the baton well ahead of Yale and Harvard.

Baseball Books

[Continued from page 19]

96R—How to Catch and Run the Bases. Edited by John B. Foster, 1930. 25c.

Complete and detailed information on catching, how to run the bases, and relationship of catching to running.

97R—How to Play the Infield and the Outfield. Edited by John B. Foster, 1933. 25c.

General discussion of all infield and outfield positions. Instructions on how to play each position based on modern methods of baseball.

202R—How to Play Baseball. Edited by John B. Foster, 1932. 25c.

Baseball for the small boy. Written simply and plainly from an instructive viewpoint. To encourage the little fellow to develop by right methods his inborn desire to play baseball well.

83R—How to Manage, Organize, etc. Edited by J. E. Wray, 1931. 25c.

How to organize a league; manage, captain, and coach a team; score a game; arrange signals, and lay out a diamond.

82X—Knotty Problems in Baseball. Edited by John B. Foster, 1930. 35c.

Contains answers to questions. Really an interpretation of the rules.

508B—Ready Reckoner. Edited by John B. Foster, 1927. 50c.

Ready reckoner of baseball club standings. Contains all the percentage figures for a championship race, of any scheduled length, up to 200 games.

100X—Official Baseball Guide. Edited by John B. Foster, 1935. 35c.

Containing the official rules with explanatory notes.

121R—Outdoor Baseball for Women. Edited by the Women's Athletic Section of the American Physical Education Association, 1935. 25c.

Rules of the game, coaching, and baseball skill tests. Also contains a large chart of baseball techniques.

12R—Softball Rules. Edited by the Joint Rules Committee of the National Recreation Association, 1935.

Containing rules and regulations of softball, also known as playground ball, diamond ball, mushball. Review of 1934 season. Articles on pitching and league organization.

Wardlaw, Charles D. *Fundamentals of Baseball.* New York: Charles Scribner's Sons, 1924. Pp. 111, illustrated—photographs and diagrams. $1.75.

The book was written by a man who had taught baseball in summer schools for approximately fifteen years, with the point of view of the educator. The author attempts to analyze the technique, the fundamentals, and the mechanics of throwing, catching, batting, and sliding. The position of each part of the body or "form" is described. A series of diagrams show the layout of the field for practice. D. K. Brace has contributed a chapter in the text, which is devoted to tests of baseball skills.

White, Charles. *Little Red Book of Baseball.* Cortlandt, New York: Charlie White, 1935. 50c.

An accumulation of the best records of major league ball since 1876, as well as a chronology of important events and changes in play since the origin of the game.

Footwork of the Catcher

[Continued from page 33]

and brought into throwing position. The support thus given by the mitt minimizes the danger of a poor throw because of a ball that wasn't gripped firmly.

The wrist snap can best be acquired and practised by the catcher when returning the ball to the pitcher between pitches. Return the ball sharply about chest high. This practice also enables the catcher to acquire accuracy in his throw.

After a catcher has mastered the knack of shifting, and automatically applies the wrist snap in his throws, he should concentrate his efforts at perfecting his throw to second base. This is a difficult throw to make. Even experienced catchers have trouble accommodating their arms to such a long wrist-motivated throw. It is a common sight to see major league catchers bounce their throws to second during an infield workout. Undoubtedly their arms are strong enough but the reason the ball falls short is because of some faulty mechanism in the release of the ball. If the young catcher finds it difficult to reach second base with his throw, he should practise releasing the ball when the arm is still above shoulder level. It isn't necessary to have a powerful arm to reach second base if the ball is given a higher trajectory arc. When the catcher is satisfied that he has mastered accuracy in his throw, he should then try for more speed.

Avoid extra step

A slightly different technique should be practised by the catcher who constantly overthrows a base. The catcher who has this failing should estimate the height of his overthrow and then practise to release the ball proportionately lower.

Avoid the bad habit of taking an extra step before throwing. The origin of this habit can possibly be traced to the desire of the catcher to show off the strength of his arm during infield drill. In order to get more speed into his throws at this time the catcher takes an extra step before throwing. The fractional speed thus gained can never compensate for the extra time it takes a catcher to get off his throw. To avoid this undesirable habit always throw from behind the plate and use the normal shift only.

Catchers should get plenty of practise while wearing their full paraphernalia. It is one thing to throw well without this impedimenta, and quite another thing to do as well when weighted down with chest protector, shin guards and mask.

Catching and throwing with a left-handed batter at bat. Most inexperienced catchers have difficulty with the problem of how to watch a base-runner on first while a left-handed hitter is at bat. If the catcher is not located to a nicety in relation to the left-handed batter it is next to impossible to see the baserunner break for second. The catcher's vision is ob-

Water Stunts Chart

42 water stunts shown in drawings, with explanatory text, on 6-ply yellow cardboard, paraffin coated for protection against moisture. Size 16"x12". Ready to hang on wall in swimming pool, locker room, gymnasium or out of doors. Price 25 cents to schools, postpaid.

Scholastic Coach Bookshop
250 E. 43rd St., New York, N. Y.

structed by the batter and the baserunner cannot be seen until he is clear of the line with the batter. Very often the runner isn't seen until it is too late to make a play on him.

The catcher who has a strong arm should try the following method of playing a baserunner when a left-hander is hitting. Move back slightly until the baserunner on first can be seen clearly. The catcher is now in a spot to see him break should the baserunner attempt to steal. From this point the catcher proceeds as in a normal steal. Shift into throwing position and nail the runner going to second.

The catcher with an average arm should use another technique. Benny Bengough, formerly of the New York Yankees and now with the St. Louis Browns and Mickey Cochrane are the best examples of big league catchers with average arms who employ the combination shift-hop technique to throw out a baserunner heading for second whenever a left-hander is at the plate. This method is identical in detail with the first until the throw is to be made, then it alters radically. Instead of simply shifting into throwing position, the catcher completes a short hop forward simultaneously with his shift. No time is lost by using the hop forward because it is done in conjunction with the shift.

■

Alcohol Drinking

[Continued from page 23]

sumption was again measured. The results were rather convincing. The increase in oxygen consumption during work was the same whether the man had alcohol or not. This means that the heat derived from the oxidation of alcohol cannot be used as a source of muscular energy and is independent from work.

Recently Rapport, Canzanelli and Guild of Tufts Medical School carried out experiments on dogs. The animals ran on a treadmill for fifteen minutes and the rate of oxygen consumption was measured. The results were similar to those found in human beings, meaning that alcohol cannot be used as a fuel for muscular work.

Sportsmanship

CLEVELAND, March 23.—The track at Public Hall conquered Glenn Cunningham, of Kansas, tonight. Cunningham slipped and fell on the last turn while running in a special half-mile exhibition race with George Arnold, former Ohio State runner.

Arnold stumbled over him and was the first to rise. Rather than take an advantage, he waited for Cunningham to get up, and the two finished the race almost neck and neck.

Cunningham was declared the winner, but the time, lengthened by the accident, was not announced. He turned his left ankle, but the injury was believed not serious.

The exhibition race was a part of the Greater Cleveland interscholastic track carnival.

Crowds

A total of 230,000 persons saw the four games of the recent English Cup soccer series in London. A total of 200,000 persons saw the games during the three days of the national softball championships at Lincoln Park, Chicago. The Sunday crowd was estimated at over 100,000. No admission was charged.

Application for Tennis Medallion

SCHOLASTIC TENNIS EDITOR
250 E. 43rd Street
New York, N. Y.

Please enter our application for the Scholastic tennis medallion, which, it is agreed, will be sent by return mail without charge to the undersigned. At the conclusion of our tournament we will send the names of the winners to Scholastic, for publication.

Name of High School.....

Address.....

Faculty Director of School Tennis Tournament.....
(Principal, coach, athletic director, physical director)

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☐ Booklets, "How to Raise Your Batting Average" and "Famous Sluggers of the 1934 Season."

HILLYARD CHEMICAL CO.
☐ Booklet, "Basketball"

HUNTINGTON LABORATORIES
☐ Basketball Shot Charts

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☐ Catalogue, swim suits

JULES RACINE
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KELLOGG'S
Kellogg Sports Library
☐ "Swimming and Diving"
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☐ Mats, booklet

A. J. REACH, WRIGHT & DITSON CO.
☐ Catalogue

JOHN T. RIDDELL
☐ Catalogue, athletic shoes

ROCKY MT. TEACHERS AGENCY
☐ Enrollment card, information

SHREDDED WHEAT
☐ Additional posters How many?

A. G. SPALDING & BROS.
☐ Catalogue

UNITED FRUIT
☐ Booklet, "How to Make That Team." How many?

VICTOR SURGICAL GUT CO.
☐ Booklet, "Footwork and Balance in Tennis"

H. E. WILLS CO.
☐ Catalogue, tennis strings

WILSON SPORTING GOODS
☐ 1935 Football guide

ZONITE
☐ "Athletes' Foot" Booklet. How many? Samples
☐ Zonite ☐ Ointment

NAME.....

POSITION.....SCHOOL.....
(Principal, coach, athletic director, physical director)

CITY.....STATE.....

Raging Controversy

[Continued from page 29]

provided personal contact does not result. If personal contact does occur the officials must decide which player is responsible, being guided somewhat by the apparent intent of the players . . .

If contact occurs, however, the foul may be on either player, but in case of doubt the responsibility should be on the player who is attempting to screen."

Mr. Murray believes that there is altogether too much emphasis being placed on set "pickoff" or screen plays by coaches. He regrets this tendency very much, and sees in it a violation of the basic idea of the game, which may ultimately bring about its destruction.

"Too many coaches are trying to make basketball a game of plays, instead of players," Mr. Murray said.

•

The Injured & Insulted

Here are Coach Leroy Sharp's nine principal "don'ts" for rooters:

1. **Don't yell "Kill 'em team!"**
2. **Don't think you know more than the team. You don't.**
3. **Don't forget your manners; if you have none, get some.**
4. **Don't forget to cheer all men injured.**
5. **Don't groan or cheer on penalties.**
6. **Don't forget the officials are the judges.**
7. **Don't make fun of opponents.**
8. **Don't cheer during signals.**
9. **Don't forget to be a sportsman, winner or loser.**

From *Weekly Scribe News*, Oakland, Calif., Technical H.S.

•

Texas U. Cinder Track

The track at the University of Texas was made with eighteen carloads of old weathered cinders. These cinders had been buried for several years and were in excellent condition to make a fast track.

Every other year we take up the entire track by hand. This keeps it in excellent condition and prevents it from becoming too hard for the men to train on. We drag the track with a harrow and smooth it off with a wire drag and rake it every week. Sometimes we do this every other day.

We have been using lignite cinders to add to the old cinders for up-keep. We break them up into fine particles and add a little each year, which keeps the track surface in excellent condition.

CLYDE LITTLEFIELD
Track Coach
University of Texas.